



Non-Domestic Energy Assessment Procedure – BER Publication and Survey Guide

VERSION: 2.1

NEAP is the official procedure for the calculation of energy performance of non-domestic buildings in Ireland for the purposes of producing Building Energy Ratings (BER) and demonstrating compliance with Part L of the Building Regulations for Non-Domestic Buildings.

This document describes the NEAP survey and BER publication methodology for non-domestic buildings. The NEAP Manual (iSBEMie User Guides) detailing the assessment methodology for non-domestic buildings must be followed alongside this document.

BER Assessors, building designers and other users must ensure that they are using the latest version of this document and accompanying software. Information and any updates will be published on the SEAI website at <https://www.seai.ie/energy-in-business/ber-assessor-support/>

As outlined in the Code of Practice, full site surveys are to be conducted for “New-final” or “Existing” building assessments and for elements constructed / installed in “New-provisional” ratings. “New-provisional” ratings are applicable where a building is sold and/or leased based on design plans and specifications of the building, typically no site survey is required. However, for Shell and Core buildings, a site survey must be conducted to verify the constructed elements, for example walls, roofs etc. and what has been installed, for example landlord services.

A BER Assessor is required to act with integrity and diligence to ensure that each BER assessment is executed competently, in an independent manner and in accordance with the Regulations, the BER Assessor’s Code of Practice and all other directions issued by SEAI. In this regard a BER Assessor is responsible for ensuring that, within reason, the data compiled and inputted to SEAI approved calculation software and all other related and recorded calculations are an accurate representation of all characteristics relevant to the energy performance of the building and are capable of being verified as such in any subsequent monitoring and compliance processes commenced by SEAI in accordance with the BER Quality Assurance System and Disciplinary Procedure.

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Key changes and additions

This section summarises the key differences between the current NEAP Survey Guide (V2.1) and V2.0

Section	Summary of change
Section: 4.6: Ceiling and floor voids	Reminder about measuring conventions
Section 6:	Clarification added regarding lack of documentary evidence for new builds.
Section 6: Guidance on Supporting Evidence	Building Surveyor added to the list.
Section 6.1: Non-Default Efficiency Data	Clarification on manufacturer's requirements Table of standards updated
Section 7.1: Building type	Expanded guidance
Section 7.1: Location description	New guidance, previously none
Section 7.2: Opaque elements	Minor clarifications
Section 7.2: Floor correction tick box	New guidance, previously none
Section 7.2: Windows – own values	New requirements for window calculation software certification and its use
Section 7.2: Curtain walling	Additional guidance
Section 7.3: Building Infiltration / Air testing	Minor clarifications
Section 7.3: Building Orientation	Additional guidance
Section 7.3: Building area	Expanded guidance
Section 7.3: Additional thermal Bridges	New guidance, previously none
Section 7.3: iSBEMie Multiplier field	New guidance, previously none
Section 7.3: Building type / Activity	Minor clarifications on evidence required
Section 7.3: Zone height	Additional guidance on its use
Section 7.3: Global Thermal Bridges tick box	Additional guidance on its use
Section 7.4: Multiplier	New guidance, previously none
Section 7.4: Height	Additional guidance
Section 7.4: Infiltration	Additional guidance
Section 7.4: User Notes	New guidance, previously none
Section 7.5: Type of Envelope	Detail of evidence required
Section 7.5: (Roof) Pitch	Reminder re: SBEM conventions
Section 7.6: Doors	Additional guidance on > 50% glazed doors
Section 7.9: District Heating Parameters	New guidance on the use of default figures
Section 7.10: (Ventilation) Heat Recovery Seasonal Efficiency	More detailed guidance on the figures to use for this data field

Section	Summary of change
Section 7.11: Does it qualify for UK ECAs?	Additional guidance explaining its purpose
Section 7.11: Was it installed in or after 1998?	New guidance, previously none
Section 7.12: Does it qualify for UK ECAs?	Additional guidance explaining its purpose
Section 7.12: Mixed mode cooling	Additional guidance on requirement to have automation
Section 7.14: M&T with alarm	Minor additional guidance on its use
Section 7.16: Bi-valent systems	New & Additional guidance
Section 7.17: (HWS) Generator Type	Additional guidance on multiple systems
Section 7.17: (HWS)heat generating seasonal efficiency	Clarification and reminder on correct entry of heat pump efficiency values
Section 7.17: (HWS) Storage Volume/ Storage Losses	Additional guidance on the MJ/month calculation
Section 7.17: (HWS) Secondary Circulation	Additional guidance on how to identify
Section 7.17: (HWS) Pump power, losses, loop length	Additional guidance on survey and data entry
Section 7.18: SES (solar thermal systems)	Highlighting changes to defaults
Section 7.19: PVS (photo voltaic systems)	Highlighting changes to defaults
Section 7.20: Wind Generators	Highlighting changes to defaults
Section 7.21: (CHP) CHPQA	Noting it is a null field
Section 7.23: Deadlegs	Minor clarification on minimum length
Section 7.24: Enhanced Natural Ventilation	New guidance, previously none
Section 7.24: Supply/ Extract SFP	Additional guidance
Section 7.24: High pressure drop air treatment	Detailed guidance added
Section 7.24: Heat Recovery Seasonal Efficiency	Guidance on use of commissioning results
Section 7.25: Local Mechanical Exhaust	Additional guidance on correct units and a calculation
Section 7.25: Scope of Extract system	New guidance, previously none
Section 7.26: What information is available on Lighting?	Clarifications on existing guidance
Section 7.26: Full lighting design carried out	Clarifications on when to use
Section 7.26: Lighting chosen but calculation not carried out	Clarifications on LOR and its use
Section 7.26: Lighting Parameters not available	New age-based guidance on selection of a default
Section 7.26: Combination of light fittings in a zone	Text moved to its own section
Section 7.27: Constant illuminance control	New guidance, previously none
Section 7.27: Automatic daylight zoning for lighting controls?	New guidance, previously none
Section 7.28: Does the display lighting use efficient lamps?	Directing to new guidance in the Appendix
Appendix 1: NEAP Survey Form	Now Snapshot of first page only

Section	Summary of change
Appendix 3: List of Activities	Activity matrix deleted. Direction to activity matrix added. Clarification text added. Direction to other useful tables provided
Appendix A4.1: Project Database	Note on default window frames
Appendix A4.1: Additional fabric entry examples	Two floor and two window examples added
Appendix A4.2: HVAC System defaults	Minor additions in the first section
Appendix A4.2: Zones with Air Curtains or Inadequate HVAC	New guidance on air-curtains
Appendix A4.2: Bivalent System defaults	New guidance on allocation. New rules apply.
Appendix A4.4: SES System	The default to be used for Auxiliary Energy Consumption has been clarified.
Appendix A4.5: PV System	Defaults updated
Appendix A4.6: Wind Turbine	Defaulted modified
Appendix A4.7: Shell and Core Buildings	Zone activity section expanded
Appendix A4.8: Default exhaust rates	Two new examples on default exhaust rate calculation
Appendix A4.9: Display Lighting	A table has been added showing zones where display lighting applies. Another new table with lamp efficacy values has been provided. An example calculation has been updated to match the guidance.
Appendix 5: Seasonal Efficiency of Heating, Cooling and Ventilation Systems	
Appendix 5.1: Boilers	Clarification on application of credits. Fuel net to gross conversion factors added. Clarification on multiple boiler installations, identical and non-identical with examples on efficiency and application of credits.
Appendix 5.2: Heat pump Guidance	Notes on hydronic heat pumps >400kW and Ecodesign regulation 2016/2281
Appendix 5.3: Cooling Seasonal Efficiency	Note added in relation to use of EER when SEER not available.
Appendix A5.4 Specific Fan Power	Guidance on use of commissioning results
Appendix A7: Identifying the Heating System	
Appendix A7.2: Zone Heating System Selection Flow Chart	Changes to top of flow chart
Table A7 Unheated Zones	Table extensively altered
Appendix 8 Assigning Adjacent conditions	
Flow chart	Flow chart extensively altered
Adjacent Condition Examples:	Examples altered, with different outcomes
Example 8.1: Indirectly Conditioned Zone	<ul style="list-style-type: none"> • This can be applied to ground floor zones now. • A HVAC is NOT assigned to the space. • Clarification on default heating system use

Section	Summary of change
Example 8.2: Partially Conditioned Space	<ul style="list-style-type: none"> • A HVAC is NOT assigned to the space. • Elements in spaces adjoining connect to UAS - partially conditioned by surrounding spaces. • Clarification on default heating system use
Example 8.3: Unconditioned adjoining space	<ul style="list-style-type: none"> • Some additional text for clarity
Appendix 9: Determining the Hot Water Storage Volume and Secondary Circulation Losses	Example with cylinder losses added
Appendix 9: Secondary Circulation Losses:	Clarifications on heat loss calculation
Appendix 11: Identifying Common Lighting Systems	Additional CFL image added.
Appendix 12: Fuel Conversion Factors	District heating values and waste heat values added to the table.

1. Introduction

This guide is designed to assist Building Energy Rating (BER) Assessors to conduct BER assessments on non-domestic buildings using iSBEMie or other approved software¹.

This manual does not replace the iSBEMie User Guides, NEAP Modelling Guide or iSBEMie Technical Manual. It provides additional guidance relating specifically to documentary evidence and surveying of non-domestic buildings and should be read in conjunction with the iSBEMie User Guide, NEAP Modelling Guide and SBEMie Technical Manual or other guides associated with the approved software being used by the Assessor.

In addition to providing guidance on the surveying of buildings, this Survey Guide indicates the necessary supporting data or evidence required when completing BER assessments on buildings, particularly when using values other than the defaults.

The current published version of the NEAP BER Publication and Survey Guide is available on [SEAI website](#).

When conducting a survey, BER Assessors must comply with the Safety, Health and Welfare at Work Act 2005 and regulations under that Act, as well as all other applicable health and safety legislation, regulations, codes, and guidelines. It is the BER Assessor's duty to make himself or herself familiar with the relevant health and safety rules, to exercise due diligence during the survey and to prevent unreasonable risk of harm or injury. Please refer to the Health and Safety Authority website for further information: www.hsa.ie.

BER Assessors are solely responsible for undertaking surveys in a safe manner. The BER Assessor should under no circumstances expose himself or herself, or any other person, to unnecessary risks of harm or injury in conducting a building survey. The BER Assessor must be mindful at all times of health and safety issues and, where the BER Assessor has reason to believe that obtaining any of the information set out in this document, or any other associated guidance provided by SEAI, may involve such risks, the BER Assessor need not and must not attempt to obtain that information.

¹ Throughout this Guide, the term "Approved Software" is used to denote iSBEMie and other SEAI approved BER software as published on [the SEAI website](#).

Assessors who have been accredited to use alternate software should note the following:

- Non default values should be used where possible, however where these cannot be substantiated default values must be used. The default values to be used are as outlined in the iSBEMie User Guides, iSBEMie software and this NEAP Survey Guide. It is the responsibility of the assessor to ensure that any defaults used in alternate software comply with the iSBEMie software and aforementioned documents. Third party software does not necessarily use or provide the same defaults as iSBEMie.
- In all cases, the methodology outlined in the iSBEMie User Guides, and this NEAP Survey Guide takes precedence over guidance from third party software.

SEAI and its agents accept no liability or responsibility for any damage, injury, death, breach of contract or negligence in respect of any dispute, claim or cause of action arising out of, or in relation to, any BER assessment.

Surveys are expected to be non-invasive. Nothing in this document, the iSBEMie User Guides or any other associated guidance provided by SEAI, shall be understood as requiring invasive surveys. Where, despite this, BER Assessors or their client conduct invasive surveys this is carried out at the BER Assessor's and the building owner's own risk and is not required by SEAI.

If invasive survey methods are used such as to demonstrate non-default data, then, while these methods are not required in the BER assessment methodology, they can be considered as a source of supporting evidence. This supporting evidence for each relevant exposed surface must clearly indicate that the non-default data being specified is appropriate for the building element in question.

Where the survey requires access to the Building Management System (BMS), the Assessor should seek out assistance from the Facilities Manager/ Building Operator and take due care and consideration not to interfere with the setup of the BMS.

BER Assessors are required to adhere to the BER Assessor's Code of Practice at all times and the definitions in the iSBEMie Manual must be followed at all times.

The survey guide should be read in conjunction with the following documents.

- [iSBEMie User Guide Vol 1: Basics](#)
- [iSBEMie User Guide Vol 2: Compliance](#)
- [iSBEMie User Guide Vol 3: BER](#)
- [Non-Domestic Energy Assessment Procedure – Modelling Guide](#)
- [BER Assessors Code of Practice](#)
- [BER Quality Assurance System and Disciplinary Procedure](#)
- [NEAP Guidance Document](#)

Information required on Building Regulations Part L (current or previous) is provided on the gov.ie website.

A Building Energy Rating is required under the following circumstances:

- When a new or existing building is offered for sale (or let) a BER certificate and accompanying advisory report must be produced by the vendor or their agent (e.g., auctioneer, estate agent or solicitor) to potential buyers or tenants.
- When a new building is offered for sale "off plans" a Provisional BER certificate and accompanying advisory report must be produced by the vendor to potential buyers or tenants, based on the pre-construction plans; and when the same new building is completed, a BER certificate must be supplied to the purchaser, based on a survey of the building as constructed (to take account of any changes during construction).
- When a new building is built for a specific owner-occupier: A BER certificate and accompanying advisory report must be procured by the person commissioning the building, prior to taking up occupation of the building.
- A person offering a property for sale or rent, or their agent, shall ensure that the energy performance indicator of the current BER certificate for the building is stated in any advertisements, where such advertisements are taken relating to the sale or letting of that building.
- Prospective buyers and renters will be shown the BER rating (Alphanumeric value) along with other prescribed content (dependent on the particular medium) in a prominent location in each specific advertisement.
- Where images of the property are used then the presentation of the alphanumeric value will be by way of the prescribed BER Alphanumeric Rating Motif for the particular property rating

The types of Building Energy Rating required are as follows:

- New Building – Provisional Rating: A rating published based on the plans and specifications for a proposed construction or a shell and core building.
- New Building – Final Rating: A rating published for a building where construction is complete and has not been sold or occupied previously.
- Existing Building – Final Rating: A rating published for a building where construction is complete and it has been sold or occupied previously.

2. Pre-survey Information Request

Prior to carrying out the survey, the Assessor should formally request from the building owner/representative information such as:

- Age of building
- Details of planning permission (reference, date)
- Access to architectural drawings and specifications for layout configuration and details of construction
- Access to any mechanical and electrical drawings and specifications to assist the Assessor in determining the nature of the equipment installed
- Details of building type and activities within the building
- Details of any modifications made in the building e.g., insulation upgrading, additional/upgraded controls, new lighting, new boilers, additional equipment, extensions, etc.
- Certification to prove that the ducting was pressure tested
- If the HVAC system is separately sub-metered and if so, where the meters are located
- Any other information related to the heating, cooling, ventilation, and air conditioning (HVAC) systems which may not be obvious but may have an impact on the BER
- Any additional documentary evidence that the owner feels is important.

Where such information is available, documentary evidence should be obtained (rather than verbal briefing). Any documentary evidence of upgrading must clearly relate to the building concerned and must be sufficiently detailed in its scope. The substantiation that would be acceptable for QA audit purposes is detailed in Section 7 of this document and where such evidence is used for BER purposes, a copy of this evidence must be retained by the Assessor and provided to the SEAI BER QA auditors on request.

The Assessor should inform the owner in writing that access to all areas in the building including boiler rooms, any hatches which provide access to insulation, controls and pipework will be required in order to conduct the survey.

3. Survey Documentation and Equipment

A number of items should be brought to the survey site to enable the successful conduct of the survey of the building. These include (but are not limited to):

Documentation:

- Approved Software Manual
- NEAP BER Publication and Survey Guide
- NEAP Guidance Document
- The SEAI NEAP survey form (Appendix 1), or similar data collection sheet/drawings (also available in electronically editable format on <http://www.seai.ie/energy-in-business/ber-assessor-support/neap/>)
- Pencil, paper, and eraser
- Graph Paper (for sketching building plans and elevations)
- Architectural plans for the building where available
- Any other available specifications for the building.

Equipment:

- Measuring tape. Electronic measuring devices may be used, provided all measurements are accurate and the equipment is properly calibrated
- Calculator
- Directional compass
- Flashlight
- Camera with flash (with macro capability to ensure text is clearly legible)
- Key for electricity meter and key for gas meter (standard tools will not open gas or electricity meters);
- Ladder (to facilitate inspection of ceiling voids and access to any roof where plant is located);
- Personal protective equipment, as necessary.

4. Data Gathering

For all data gathered, supporting documentary evidence is required to substantiate any entries in the NEAP software. This documentary evidence must be retained by the Assessor as outlined in the BER Assessor's Code of Practice. BER Assessors must endeavour to gather as much data, photographs and supporting evidence as possible to increase the likelihood of an accurate survey and assessment which will stand up to auditing by SEAI. The list of supporting evidence detailed in this guide is for guidance purposes and will be added to over time. Other methods/supporting data may be considered by SEAI on a case-by-case basis, as they arise.

Where "As Built" drawings and specifications are available for a building, it is the responsibility of the Assessor to verify that the data is accurate through a site survey and to ensure that any data input into the NEAP software is accurate. In verifying "As Built" drawings, assessors should have documentary evidence from the site survey to support the drawings, for example: marked up drawings showing measurements on site, photographs and completed survey form or report. "As Built" drawings shall be suitably marked by the contractor to indicate they are prepared by the contractor.

"Issued for Construction" drawings can also be used as documentary evidence to support a BER, however the "Issued for Construction" drawings must be supplemented with documentary evidence from a site survey. For example, an Assessor has "Issued for Construction" drawings from the M&E consultant detailing the lighting installation. The Assessor should provide additional information to substantiate that the lighting was installed as per the "Issued for Construction" drawings. This should be signed off by the relevant construction professional:

- Photographs of the light fitting as installed.
- Survey Sheet detailing the light fittings as installed.
- Documentation from building O&M manuals

For Shell and Core buildings,

- Where an element has been constructed, documentary evidence for that element is as per New Final or Existing Buildings
- Where an element has not been completed or installed, documentary evidence is as per the New Provisional requirements, i.e., "Design" drawings and specifications may be used.

If clarification is required by the BER Assessor, specific queries related to the acceptability of supporting documentary evidence should be directed to the BER Helpdesk prior to the publication of a rating.

The SEAI NEAP survey form (see Appendix 1) assists Assessors in ensuring that they have gathered all the necessary documentary evidence during the survey of a building. This includes data regarding the dimensions, building age, building fabric elements, relevant items per room, HVAC system(s), hot water services, HVAC controls, lighting, and lighting controls. This should be accompanied by building sketches/architectural drawings and comments related to various aspects of the site survey. It is acceptable for Assessors to use their own custom survey form/report or survey report provided it captures at least the same data as the SEAI survey form.

In addition to the above, the assessor must provide photographic evidence to support data gathered during the survey of the building as detailed in Section 7 of the Survey Guide. Assessors should reference the photograph applicable to each zone on a survey form/report, for example:

Figure 1: Zones for building services

ZONES: BUILDING SERVICES DETAILS					
Zone name	Description	Building type	Activity#	Area m2	Height m
z0/01	Open Plan Office Photos 001 - 005	Office	Open Plan Office	100	3.5
z0/02	WC Photos 006	Office	Toilet	10	3.5

The reference used on the survey form/report should correlate to the name of the photograph filename supplied as documentary evidence during the audit process.

Photographs must be clear. Assessors should read the camera’s manual to gain a full understanding of how the camera is operated, paying particular attention to the use of flash, macro, and focus.

The following simple tips should also be adhered to:

- Ensure that the camera is set up correctly prior to taking the photograph. It is important to ensure that adequate resolution is set up.
- Hold the camera steady
- Give the camera time to focus
- For close-up shots, the camera’s macro function may take several seconds to gain correct focus
- Use the flash in poorly lit spaces (the camera’s auto-flash setting will do this automatically, generally with good results)
- When using the flash on an object several metres away try to ensure there are no objects in the foreground as this can affect the focus and/or over-expose the photograph
- Check the photograph. If it is not of sufficient quality, retake the photograph.

4.1 External Survey

An initial survey of the outside of the building should be carried out. The following information can be gathered by external survey:

- External measurements to establish/check the overall footprint of the building. External measurements must be converted to internal measurements before calculating floor area and heat loss areas
- Establishing ventilation features such as number of vents, extract fans, air intakes and external air handling plant
- Assessing age band indicators, such as meter box date information
- Confirming the orientation of the building using a directional compass
- Establishing which walls of the building are party walls and determining the building type of the adjoining buildings
- Establishing shading characteristics
- Details of any renewable technologies, such as solar panels and wind turbines
- Establishing any external plant rooms/ energy centres serving the building.

4.2 Internal Survey

An initial walk around inside the building is especially useful and assists in determining the following information:

- Confirming the Building Activities.
- Confirming heat loss envelope elements such as ground floor type(s), wall types, window variations and in completing survey sketches for each floor, zone, wall, and other element types.

- Assessing age band indications such as date stamp in the gap within double/triple glazing
- Identifying internal elements with high thermal mass composition.
- Identifying elements adjoining unconditioned spaces.
- Confirming the ventilation as indicated from outside the building.
- Confirming the various HVAC systems within the building.
- Confirming the various Lighting and Lighting Control systems within the building.

4.3 Building Sketches and Architectural Drawings

A sketch of the building must be made showing plans and elevations. Where architectural drawings are available, these can be used instead of sketches, provided any differences between the architectural drawings and actual measurements taken on site are noted on the architectural drawings by the BER Assessor. The original sketches and/or architectural drawings must be kept on file as supporting evidence for the BER assessment. The dimensions used in the NEAP assessment should reflect the actual measurements taken during the survey. Sketches/drawings, combined with a completed survey form/report from site survey and other evidence as outlined in this document, are required to support data entered in the data file to complete a BER assessment using the iSBEMie or other software. Plans and elevation drawings used as evidence must be representative of the building.

As a guide, the sketches/drawings should at least indicate the following:

- Each zone entered in NEAP software
- Activity in each zone
- Different walls, floors, and roof types
- Dimensions (total floor area, zone areas, wall thickness, floor heights, element dimensions)
- Unconditioned spaces – identifying elements between conditioned and unconditioned spaces
- Adjacent buildings (beside party wall)
- Extensions/ alterations to the building – identifying where the age of the building differs
- Openings:
 - Door types, dimensions, and orientations (with estimate of percentage glazing)
 - Window dimensions and orientations
 - Type(s) of glazing (e.g., single glazed, double glazed, any information about filling or glazing type)
 - Opening frame type(s) (PVC, Wood, metal, and evidence of thermal break, if possible, to determine)
 - Measured gap between panes, if possible, not including the thickness of the glazing panes
 - Overshading estimate on each opening

4.4 Floor by Floor Survey

A sketch or architectural drawing must be provided for each floor showing partitions, wall openings and zones. Where architectural drawings are used, it is the responsibility of the Assessor to ensure the accuracy of the drawings in relation to the finished construction; therefore, architectural drawings must be altered to reflect changes in the finished building.

Each room/area must be checked for the following:

- Activity in each area
- Building fabric in each area
- Room heights
- Type of HVAC in each area and how it is controlled
- Type of lighting and how it is controlled
- Any additional ventilation, separate to the main HVAC system in each area
- Properties of openings such as:
 - Type of glazing (double, single, triple, stamp/brand on windows)
 - Dimensions
 - Frame type
 - Gap between glazing
 - Overshading
 - Orientation

This information should all be collected in a completed NEAP survey form (Appendix 1) or Assessor's own version of survey form/report from site survey. Refer to Appendix 2 of this document for Guidance on Zoning, Appendix 3 for information on Activities and Appendix 6 for examples of zone height calculation.

4.5 Plant Room Survey

Each plant room should be surveyed with particular reference to the following.

- Boiler plant
- Refrigeration plant
- Air handling units
- Fans
- Calorifiers (hot water system)
- Heat exchangers
- Heat recovery equipment
- Controls related to all building services plant.

For all plant items, e.g., boilers, refrigeration equipment, air handling units, fans, humidifiers, heat recovery units, heat exchangers, hot water calorifiers, pumps, nameplate details must be recorded where accessible, and a photo must be taken to facilitate later identification of the equipment concerned in support of data entered in the data file.

4.6 Ceiling and Floor Voids

Accessible ceiling and floor voids must be inspected to determine what equipment, particularly HVAC equipment, is present, and to determine the correct zone height. This provides useful information as to the type of HVAC used in the building. Where possible, photos should be taken to demonstrate the HVAC systems present. Accessible ceiling includes for ceilings where ceiling tiles can be lifted. For the purpose of zone height and surrounding wall areas, suspended ceiling voids and floor voids are included in the measurement of zone heights. Refer to Section 3.4 in the iSBEMie User Guide Vol 1 Basics for details.

4.7 Attic Spaces

Useful building compositional properties can be determined by accessing the attic space where such exists:

- Evidence of wall and roof construction
- Roof insulation thickness.
- HVAC plant

Particular attention must be paid to health and safety issues when accessing attic spaces and ceiling voids.

4.8 Missing or Non-Operational Building Services Equipment

NEAP assumes that the fixed installed building services equipment is operational and takes no account of whether it is working or not. However, where a significant portion of a system is missing or damaged and therefore clearly not serviceable then, an appropriate default system is selected as described in Appendix 4.3 of this document.

For example, in the case of a building served by a central heating system and the boiler is missing or removed, the assessment should be based on a default HVAC system (refer to Appendix 4.2 of this document) as there is no heat source in the building. Similarly, if there are no space heat emitters, the boiler cannot heat the building and therefore a default HVAC system should be assumed.

In the case of a missing or removed cylinder, where the cylinder is required to provide hot water, effectively there is no facility to heat hot water and therefore a default HWS system is used (refer to Appendix 4.3 of this document). In the case of controls that are not operational but are installed, for example lighting controls, it is assumed that they are operational and should be accounted for. Guidance should be sought from the helpdesk if a BER Assessor is uncertain whether to include or to omit an incomplete system.

4.9 Data Protection Note on Collecting Supporting Evidence

Supporting evidence, **referred to in Section 8 of the Code of Practice**, is collected for the purpose of completing an accurate BER assessment². This supporting evidence has the potential to contain personal data, which may be used to identify an individual. When collecting supporting evidence, BER Assessors should endeavour to avoid the collection of any un-necessary personal data or sensitive information.

“Personal data” means information that identifies or can identify an individual, directly, or indirectly, by reference to an identifier. Sensitive personal information can include: any symbols or items that can identify the racial or ethnic origin, political opinions, religious or philosophical beliefs (eg., religious symbols on the wall), any items that can identify a person’s health or sexual orientation, and/or any other items (e.g., personal or family photographs, certificates) that may identify an individual.

Guidance Note on Collecting Photographic Evidence

Photographic evidence has the potential to contain personal data. Assessors must take care that no sensitive information is captured within the photographic evidence of an assessment, which may then be used to identify an individual.

Before taking internal or external photographic evidence, BER Assessors should determine if there is any personal data within the frame, including sensitive personal data.

Guidance Note on Redacting Personal Information from Supporting Evidence

In cases where the supporting evidence collected contains personal data, this data must be removed. It is sufficient to ‘black-out’ any personal data on scanned documents. Alternatively, software tools are readily available for editing and redacting personal data from electronic versions of supporting evidence.

This does not include information that relates directly to the building e.g., the property address, MPRN and Eircode, which is information SEAI requires to record the BER assessment.

Note on the Storage and Use of Supporting Evidence

BER Assessors are responsible for ensuring that supporting evidence is collected, stored, and used in a safe and secure manner, and is only used for the purposes for which it was collected i.e., for the completion of BER assessment. BER Assessors should ensure that they maintain a secure document management system in line with data protection rules.

5. BER Assessor Using Assistance to Gather Information

BER Assessors are required to abide by all the terms and conditions outlined in the Code of Practice for BER Assessors. This includes the condition that a BER Assessor must take full responsibility for each BER assessment that they conduct. For a New Build Final, Existing or Shell and Core building, the BER Assessor is required to visit premises being assessed, the BER Assessor is responsible for:

- the collation of the data required for the assessment
- ensuring that, within reason, the data compiled is an accurate representation of all characteristics relevant to the energy performance of the building
- verification of data in any subsequent auditing, monitoring and compliance processes commenced by SEAI.
- Any assistance must be supervised by the BER Assessor

Refer to the SEAI BER [Quality Assurance and Disciplinary Procedure](#) and the BER assessors [Code of Practice](#) for further guidance.

² This data protection note on collecting supporting evidence is relevant to BER assessments, where personal data may be collected and used to identify an individual.

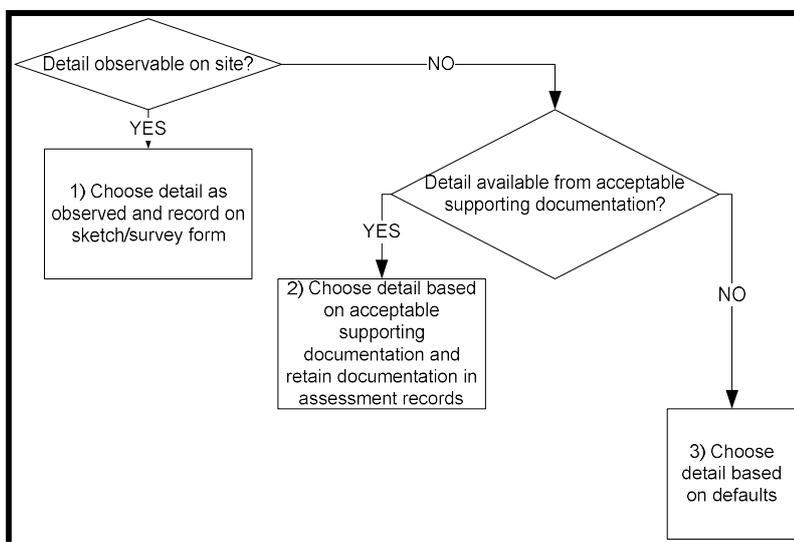
6. Guidance on Supporting Evidence

Age-band defaults do not apply to new-final or new-provisional BERs. Supporting evidence must be available to assessors in order to carry out a new-final or new provisional BER assessment.

As a general rule the default values in NEAP are conservative and must be used unless non-default values can be supported through acceptable documentary evidence or evidence recorded on site. Assessors are expected to make reasonable efforts to confirm that any default values used are selected correctly **and only when non-defaults are unavailable**.

The following diagram illustrates the order of priority for each data item in a BER assessment.

- The actual data observed on site takes precedence.
- Where the data item is not observable, it should be detailed using documentary evidence. Documentary evidence must be retained with the assessment records.
- Where the data item is not observable on site or via documentary evidence, then a default is used.



This order of priority must be considered for all parameters entered in the NEAP software. For example, the Assessor is expected to take details of the boilers, check their efficiency as outlined in Section 7 of this document and to use this value if it differs from the default value. The Assessor is expected to make reasonable efforts to ascertain non-default values rather than opting for default values. In all cases, supporting evidence must be obtained and retained by the Assessor for all non-default values used.

Non default values can be supported by a range of documentation as outlined in Section 7. Examples of documentary evidence include “As Built” drawings, Reports of work, Photographs, Copies of invoices/ receipts etc. Drawings marked “For Construction” may be used as “As Built” drawings if the drawings are signed off by the Assigned Certifier as equivalent to “As Built” drawings.

The copy of invoices/ receipts must have a detailed description of the work concerned and must clearly identify the work with the building concerned. Evidence of works carried out in the building from an Assigned Certifier or a relevant constructional professional who is responsible for the works are acceptable as supporting documentary evidence. Such evidence needs to be signed and dated on company headed paper or company-branded e-mail to provide sufficient detail for the NEAP entry in question.

For example, for retrofitted insulation, the invoice/receipt or report should detail the property address, material type, thickness and thermal conductivity, density of fill, area covered etc. Thermal conductivity values for common building materials in new and existing buildings can be obtained from Building Regulation TGD L – Buildings Other Than Dwellings (Table A1) or from CIBSE Guide A. For existing and new-provisional buildings, I.S. EN 10456: 2007 or CIBSE Guide A may be used to determine the thermal conductivities for insulation products; however, the preferred option is that thermal conductivity values are obtained for specific insulation products and the data should be obtained from accredited test data (for example an Agrément Certificate from the NSAI) in compliance with the

relevant standards in TGD L. For new-final BERs, thermal conductivity values for insulation products must be obtained from accredited test data to the relevant standards in TGD L.

General Guidance on the Calculation of U-values to the relevant standards is contained in Report [BR 443](#) "Conventions for U-value Calculations" 2006. For building elements and components generally, the method of calculating U-values is specified in I.S. EN ISO 6946: 1997. U-values of components involving heat transfer to the ground, e.g., ground floors with or without floor voids, basement walls, are calculated by the method specified in ISO 13370:2017. Software packages to perform U-value calculations for different building elements in accordance with the relevant standards above are readily available. Details, such as element thicknesses, thermal conductivities, and resistances, used in carrying out U-value calculations must be retained in the BER assessment records by the BER Assessor.

Where there is adequate documentary evidence to support a non-default U-value, a non-default **km** value must also be used based on the makeup of the construction. The **km** value is calculated in compliance with CEN standard: EN 13790 using the method in 3.3.1 of How to use iSBEMie (Volume 2) . The **km** value is the effective thermal capacity of an element and accounts for the time it takes for heat to flow in or out of the building fabric. Refer to Appendix A4.9 of this document for details on calculation of **km** values, software packages are available to calculate **km** values.

6.1 Non-Default Performance Data

The following may be acceptable evidence, depending on the type of non-default performance data. More details can be found in Section 7 of this document:

- Technical data sheets on "CE marked" literature provided that the literature refers to the relevant test performance standard and includes the relevant performance data.
- Technical data sheets from manufacturers in compliance with the Ecodesign Regulations. Literature must contain reference to the relevant Ecodesign Regulation and include the relevant performance data.
- Accredited Test certificates clearly relating to the product in question or as verified by the manufacturer/supplier as having the same performance as the installed product, must comply with the following:
 - Installation instructions in the test certificate on which the stated performance depends must be adhered to
 - Test certificates must be in English or be accompanied by a certified English translation. The translation can be from the accredited test house or from a professional translator listed by the Irish Translators and Interpreters Association or international equivalent
 - The relevant test performance standard must be stated on the test certificate
 - The test laboratory must be accredited for testing the product in question. This may be demonstrated as follows:
 - The governing accreditation body for the test laboratory can be found under <http://www.european-accreditation.org/>. This governing body may list the test laboratory as accredited
 - The accredited laboratory may be found under <http://ec.europa.eu/enterprise/newapproach/nando/>.
- A Declaration of Performance (DoP) as used for CE marked products provided the following requirements are met:
 - The DoP must display the relevant standard for the product in question as referenced in the NEAP methodology.
 - The DoP must show the relevant performance data for use in NEAP in sufficient detail for the data to be used in NEAP.

If the above data is available on the DoP document, the product must have a CE mark referencing the DoP reference number being used. The CE mark would typically be on the product itself, associated literature, or product packaging. This DoP reference number on the CE marked literature/label must match the DoP reference number on the DoP document being used or else the DoP cannot be used. A copy of the CE mark showing the DoP number along with a copy of the DoP itself must be retained by the BER Assessor as supporting evidence.

If using a DoP document as supporting evidence for a BER, the above data suffices, without the need to verify that the DoP document follows the required format to the exact requirements in the Regulation. Verifying the DoP

format any further than the above is beyond the scope of what would be required of a BER assessor. Only the relevant data is checked for the BER assessment.

Table 1: Reference to relevant EU/ Ecodesign Directives and Testing Standards for Performance Data.

Item	EU/ Ecodesign Directives	Standard
Heat Recovery Seasonal Efficiency	EU 1253/2014	EN 13141-7 and EN ISO 5801 I.S. EN 13053:2019 and EN 308 EN 13141-8 and EN ISO 5801
Heating Generator Seasonal Efficiency <i>Refer to Appendix 5 of this document for adjustment of efficiency for entry in NEAP.</i>	92/42/EEC Efficiency requirements for new hot-water boilers fired with liquid or gaseous fuels. EU 813/2013 – space heaters and combination heaters EU 2015/1189 – solid fuel boilers EU 206/2012 – Air Conditioners and comfort fans EU 2016/2281 - Air heating products, cooling products, high temperature process chillers and fan coil units Please contact the helpdesk for guidance on hydronic heat pumps with capacity greater than 400kW Local space heaters including radiant heaters: EU 2015/1188 - implementing Directive 2009/125/EC.	Gas Boilers: EN 15502-1: Gas-fired heating boilers requirements & tests Oil Boilers: For condensing boilers: EN 15034:2006. Heating boilers – Condensing heating boilers for fuel oil; For standard and low temperature boilers: EN 304:1992; A1:1998; A2:2003; Heating boilers For standard and low temperature boilers: EN 304:1992; A1:1998; A2:2003; Heating boilers Heat Pumps – Space Heating: EN 14825 Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling – Testing and rating at part load conditions and calculation of seasonal performance EN 14511 – For Double Duct/ Single Duct air conditioners Biomass Boilers: EN303-5: 2021 or EN303: 2013 Heating Boilers for solid fuels, manually or automatically stoked, nominal heat output of up to 500kW. Radiant Heaters: I.S. EN 17175:2019 Gas-fired overhead radiant strip heaters and multi-burner continuous radiant tube heater systems for non-domestic use - Safety and energy efficiency or EN 416 2009 Single burner gas-fired overhead radiant tube heaters for non-domestic use

Item	EU/ Ecodesign Directives	Standard
Cooling Generator Seasonal Efficiency Refer to Appendix 5 for adjustment of efficiency for entry in NEAP.	EU 206/2012 – Air Conditioners and comfort fans EU 2016/2281 - Air heating products, cooling products, high temperature process chillers and fan coil units	EN 14825 Air conditioners, liquid chilling packages and heat pumps, with electrically driven compressors, for space heating and cooling – Testing and rating at part load conditions and calculation of seasonal performance EN 14511 – For Double Duct/ Single Duct air conditioners
Duct leakage		IS EN 1507:2006, IS EN 12237:2003 and IS EN 13403:2003
AHU leakage		IS EN 1886:2007
Specific Fan Power	Please note that this is a calculation method rather than a test standard	IS EN 13779:2007 - Annex D
HWS Generator Seasonal Efficiency Refer to Appendix 5 for adjustment of efficiency for entry in NEAP.	EU 813/2013 and EU 814/2013 – water heaters and combination heaters EU 2015/1189 – solid fuel boilers EU 206/2012 – Air Conditioners and comfort fans EU 2016/2281 - Air heating products, cooling products, high temperature process chillers and fan coil units	Gas Boilers: EN 15502-1:2012 Gas-fired heating boilers Oil Boilers: For condensing boilers: EN 15034:2006. Heating boilers - Condensing heating boilers for fuel oil For standard and low temperature boilers: EN 304:1992; A1:1998; A2:2003; Heating boilers Heat Pumps – DHW EN 16147 Biomass Boilers: EN303-5: 2021 or EN303: Heating Boilers for solid fuels, manually or automatically stoked, nominal heat output of up to 500kW.
HWS Cylinder	EU 813/2013 and EU 814/2013 – Water heaters and combination heaters	EN 12897 EN 12977-3
HWS Secondary Circulation Losses		EN ISO 12241:2008
Solar Thermal Collectors		EN ISO 9806 IS EN 12975 IS EN 12976 IS EN 12977
Photovoltaics		IS EN 61215 EN 60904-3:2016 Measurement principles for terrestrial photovoltaic (PV) IS EN 61646

Item	EU/ Ecodesign Directives	Standard
CHP	CHP Directive EU 813/2013 and EU 814/2013 – water heaters and combination heaters	IS EN 15316-4-4

6.2 Alternate Software Packages

Where assessors are using alternative approved software packages, care must be taken to ensure that where default values are not prepopulated by the software that the assessor manually populates them to match the defaults from iSBEMie.

7. Information Regarding Individual iSBEMie Inputs

The following tables supplement the software application manual (i.e., iSBEMie User Guides) when gathering data for buildings and in confirming compliance with Section 15 (Monitoring and Compliance) of the BER Assessors Code of Practice. Section 6.1 of iSBEMie User Guide - Basics (Volume 1) describes the iSBEM user interface. Where documentation is used to substantiate non-default values, it must describe the nature of the work in detail and leave no doubt that it is related to the building and systems being assessed.

The list of supporting evidence detailed in this section is for guidance purposes and may be amended over time. If in doubt whether or not the evidence recorded meets requirements in terms of evidence, the Assessor should contact the BER helpdesk. Other methods/supporting data may be considered by SEAI on a case by case basis, as they arise.

7.1 iSBEMie Software Tab: “General”

Data Entry Item	Guidance	Documentary Evidence
Stage of analysis	The Assessor choses from: New Building – Provisional New Building – Final Rating Existing Building – Final Rating Refer to Section 1 of this document for guidance on correct selection.	Evidence of construction date and occupancy: Architectural drawings Correspondence from client Photographs
Project complexity	Complexity of the building for the purposes of the Building Energy Rating. Select level 4	Not required

Data Entry Item	Guidance	Documentary Evidence
Building type	<p>This relates to the current building use which may have changed since the building was built, e.g., schoolhouse converted to a restaurant.</p> <p>The Building Type defines the majority of the building and is displayed on the BER certificate. The Building Type globally sets the activities that are offered for the zones. However, alternative activities for other building types remain available for selection at zone level. The Assessor should refer to Section 3.3 of the iSBEMie Technical Manual for descriptions of all the building types. Refer to Appendix A of the iSBEMie User Guide - Basics (Volume 1) for a list of activities associated with the building types. Assessors are reminded that a BER is an “asset Rating.” It does not try to measure how efficiently a building is being operated. In deciding the most suitable Building Type, BER assessors may take into account that the current occupant could vacate and remove their furniture and equipment.</p>	<p>The evidence required to select building type can be met by one or more of the following:</p> <p>Internal photographs showing the building type; with Assessor’s drawing and sketches.</p> <p>Architectural drawings.</p> <p>Correspondence from client detailing the building type.</p> <p>Planning documentation.</p>
Age of building	<p>This is a key item of information because it forms the basis for selecting default values which in turn have a significant impact on the rating obtained. Similar methods must be applied when determining the age of any extensions/major refurbishments within the building. Refer to Appendix 4 of this document for the relationship between the age of construction and relevant building regulations. The “Year of Construction” is that of the original completion date of the oldest part of the building. Further information on the date of renovations and extensions can be provided in the “Location Description.” There is no default for a building age.</p>	<p>A copy of building legal documents such as the commencement notice, final build contract, completion cert, etc. are the preferred evidence of age. In the absence of such documentation, then a combination of the following indicators, supported by documentary evidence may be used (a minimum of two indicators are required):</p> <ul style="list-style-type: none"> ● Stylistic evidence ● Planning permission documents ● Building or development age plates ● Electricity meter age ● Glazing age printed within double or triple glazing ● Building owner’s knowledge (in writing). ● Ordnance Survey of Ireland Geohive website

Data Entry Item	Guidance	Documentary Evidence
MPRN	<p>The MPRN can be found on the electricity bill for the building. In the absence of electricity bills, the MPRN may be printed in the electricity meter box, or this information can be sourced from the ESB.</p> <p>The MPRN extranet on the Non-Domestic National Administration System (NDNAS) should be used to confirm that the MPRN is correct. Should an MPRN be unavailable, in the case where a building has no electricity supply, a SEAI property reference number (Dummy MPRN) will be required. A Dummy MPRN can be obtained by completing a RO11 Form which is available on the SEAI website.</p> <p>The completed form is then submitted https://www.seai.ie/home-energy/building-energy-rating-ber/support-for-ber-assessors/software/index.xml to the SEAI Helpdesk.</p> <p>It is possible to enter more than one MPRN for a building where multiple MPRNs exist. Additional MPRNs will be saved into the XML file generated for the BER. However, only the first MPRN in the entered list will appear on the draft Advisory Report generated by the software.</p>	<p>Copy of utility bill for the building or as supplied by the utility provider. Photograph of the electricity meter box.</p> <p>Email from ESB networks confirming an MPRN based on the meter number.</p> <p>If an RO11 form was used, the Assessor should retain a copy of the correspondence.</p>
Building address	<p>Address to identify the location of the building should be taken from utility bills. The software requires that an Eircode be entered to run the software. Should an Eircode be unavailable, such as in the case of a Provisional Building, the following Eircode is to be used: D01 W123</p>	<p>Copy of utility bill.</p> <p>The address should allow for unique identification of the property in so far as possible, and in such a way that prospective purchasers or renters (or their agents) can content themselves that the rating before them in fact relates to the property in question. Assessors should confirm the address with the client. Utility bills, Eircode Finder, An Post's address verification service and Geodirectory provide other means of verifying the building address.</p>

Data Entry Item	Guidance	Documentary Evidence
Location description	<p>Optional field: Can be used to briefly describe the building so that it could be better understood by someone viewing the file. The description might include ages of extensions, parts of building subject to BER or other useful information.</p>	No requirement for evidence.
Energy assessor details	<p>The BER Assessor enters their details. Please note that an XML upload will be rejected where the "Assessor number" and the "Assessor Comp. No." are missing or incorrect.</p>	None
Client details	Do not complete this section	Not required

7.2 iSBEMie Software Tab: “Project Database”

Data Entry Item	Guidance	Documentary Evidence
<p>Heat loss roof U-values and Thermal Capacity Value km</p>	<p>U-values and km values should be calculated based on the standards outlined in Section 3.3 of How to use iSBEMie (Volume 2) and Appendix A of TGD L. Section 6 of this document outlines the relevant guidance and standards for U-value calculations.</p> <p>Where there is adequate documentary evidence to support a non-default U-value, a non-default km value must also be used based on the makeup of the construction. Section 6 of this document outlines the relevant guidance.</p> <p>Where specific thermal properties are not available for building materials in existing buildings, details should be obtained from the Building Regulations TGD L or CIBSE Guide A.</p> <p>For accessible roof void areas, ensure insulation depth is established by taking the average of a number of measurements. Different U-values (e.g., Different depths or materials) must be treated as separate roofs.</p> <p>Non-default values should be used where possible.</p> <p>When using non-default U-values for a roof facade, supporting evidence must indicate that the relevant roof facade has achieved the non-default U-value.</p> <p>Default values to be used unless acceptable evidence to support non-default values is available. Where default values are used, evidence is required to support age of construction and the type of construction.</p>	<p>The evidence required to use non-default building characteristics (e.g., U-values/km values) are met by one of the following:</p> <ul style="list-style-type: none"> • “As Built” drawings for New Final, New Provisional – Shell and Core or Existing BERs showing the makeup of the roof construction including the insulation material used and thickness of the insulation <p>Or</p> <ul style="list-style-type: none"> • Photographs during construction of the element concerned which clearly identify the superior construction and that they are of the building concerned • Copies of invoices with a detailed description of the work concerned and must clearly identify the work with the building concerned. • Design drawings for New Provisional BERs showing the makeup of the roof construction including the insulation material used and thickness of the insulation <p>Note: documents should indicate address, date and insulation material and thickness used. Photographs/photocopies of documentation should be retained as supporting evidence.</p> <p>Note: U value and km value calculations details to be retained and clearly cross reference to material properties for all relevant materials.</p>

Data Entry Item	Guidance	Documentary Evidence
<p>Wall U-values and Thermal Capacity Value km</p>	<p>U-values and km values should be calculated based on the standards outlined in Section 3.3 of How to use iSBEMie (Volume 2) and Appendix A of TGD L. Section 6 of this document outlines the relevant guidance and standards for U-value calculations.</p> <p>Where there is adequate documentary evidence to support a non-default U-value, a non-default km value must also be used based on the makeup of the construction.</p> <p>Refer to Appendix 4.10 of this document for an example calculation.</p> <p>Where specific thermal properties are not available for building materials in existing buildings, details should be obtained from the Building Regulations TGD L or CIBSE Guide A.</p> <p>The presence of additional insulation must be supported by appropriate documentary evidence.</p> <p>Non-default values should be used where possible.</p> <p>When using non-default U-values, supporting evidence must indicate that the entire wall has achieved the non-default U-value.</p> <p>Default values to be used unless acceptable evidence to support non-default values is available. Where default values are used, evidence is required to support age of construction and the type of construction.</p>	<p>The evidence required to use non-default building characteristics (e.g., U-values/km values) are met by one of the following:</p> <ul style="list-style-type: none"> • “As Built” drawings for New Final, New Provisional – Shell and Core or Existing BERs showing the makeup of the wall construction including the insulation material used and thickness of the insulation <p>Or</p> <ul style="list-style-type: none"> • Photographs during construction of the element concerned which clearly identify the superior construction and that they are of the building concerned • Copies of invoices with a detailed description of the work concerned and must clearly identify the work with the building concerned. • Design drawings for New Provisional BERs showing the makeup of the wall construction including the insulation material used and thickness of the insulation <p>Note: documents should indicate address, date and insulation material and thickness used. Photographs/photocopies of documentation should be retained as supporting evidence.</p> <p>Note: U value and km value calculations details to be retained and clearly cross reference to material properties for all relevant materials.</p>

Data Entry Item	Guidance	Documentary Evidence
<p>Floor U-values and Thermal Capacity Value km</p>	<p>U-values and km values must be calculated based on the standards outlined in Section 3.3 of How to use iSBEMie (Volume 2) and Appendix A of TGD L. Section 6 of this document outlines the relevant guidance and standards for U-value calculations.</p> <p>Where there is adequate documentary evidence to support a non-default U-value, a non-default km value must also be used based on the makeup of the construction. Appendix 4.10 of this document provides an example calculation.</p> <p>Where specific thermal properties are not available for building materials in existing buildings, details should be obtained from the Building Regulations TGD L or CIBSE Guide A. Appendix 4.10 of this document provides an example calculation.</p> <p>Non-default values should be used where possible.</p> <p>When using non-default U-values, supporting evidence must indicate that the entire floor has achieved the non-default U-value.</p> <p>Default values to be used unless acceptable evidence to support non-default values is available. Where default values are used, evidence is required to support age of construction and the type of construction.</p>	<p>The evidence required to use non-default building characteristics (e.g., U-values/km values) is met by one of the following:</p> <ul style="list-style-type: none"> • “As Built” drawings for New Final, New Provisional – Shell and Core or Existing BERs showing the makeup of the floor construction including the insulation material used and thickness of the insulation <p>Or</p> <ul style="list-style-type: none"> • Photographs during construction of the element concerned which clearly identify the superior construction and that they are of the building concerned • Copies of invoices with a detailed description of the work concerned and must clearly identify the work with the building concerned. • Design drawings for New Provisional BERs showing the makeup of the floor construction including the insulation material used and thickness of the insulation <p>Note: documents should indicate address, date and insulation material and thickness used. Photographs/photocopies of documentation should be retained as supporting evidence.</p> <p>Note: U value and km value calculations details to be retained and clearly cross reference to material properties for all relevant materials.</p>
<p>Tick if the U value is corrected</p>	<p>The box is initially unticked; so, where an Assessor is entering their own U value for a Floor in contact with underground the box will need to be ticked if the U-value has been modified/corrected to account for any ground effect (perimeter to area) or edge insulation.</p>	<p>Evidence of a U value calculation indicating if a correction has been applied to a floor in contact with the ground.</p>

Data Entry Item	Guidance	Documentary Evidence
<p>Door U-Value and Thermal Capacity Value km</p>	<p>U-values and km values must be calculated based on the standards outlined in Section 3.3 of How to use iSBEMie (Volume 2) and Appendix A of TGD L. Section 6 of this document outlines the relevant guidance and standards for U-value calculations.</p> <p>Where there is adequate documentary evidence to support a non-default U-value, a default km value may be used if a non-default value based on the makeup of the construction is not available. The default km value should be 6.75 kJ/m²K.</p> <p>Where specific thermal properties are not available for building materials in existing buildings, details should be obtained from the Building Regulations TGD L or CIBSE Guide A.</p> <p>Non-default values should be used where possible.</p> <p>Default values to be used unless acceptable evidence to support non-default values is available. Where default values are used, evidence is required to support age of construction and the type of door installed.</p>	<p>The evidence required to use non-default building characteristics (e.g., U-values/km values) are met by one of the following:</p> <ul style="list-style-type: none"> • “As Built” drawings/ specification for New Final, New Provisional – Shell and Core or Existing BERs detailing the Door make and model and copies of certified U-values <p>Or</p> <ul style="list-style-type: none"> • Copies of invoices with technical characteristics of the door, clearly identifying that it relates to the building concerned. • Design drawings/ specification for New Provisional BERs detailing the Door make and model and copies of certified U values. <p>Note: documents should indicate address, date and insulation material and thickness used. Photographs/photocopies of documentation should be retained as supporting evidence.</p> <p>Note: U value and km value calculations details to be retained and clearly cross reference to material properties for all relevant materials.</p>

Data Entry Item	Guidance	Documentary Evidence
<p>Window U-value, T-Solar and L-Solar</p>	<p>Non-default values for U-values, Solar and Light Transmittance values supplied by manufacturers or suppliers are calculated based on the standards outlined in Appendix A of TGD L which includes I.S. EN 410.</p> <p>The U-value entered in NEAP for a window must be for the whole window opening including the window frame. There are a number of typical sources for window U-value and light & solar transmittance data such as Window Energy Performance (WEP) certificates, British Fenestration Rating Council (BFRC) certificates, accredited test data / Declaration of Performance to relevant standards and calculations to relevant standards.</p> <p>Measurements of thermal transmittance for doors and windows should be made according to IS EN ISO 12567-1. All non-default data used in calculations must be obtained from accredited sources.</p> <p>Alternatively, U-values of windows and doors may be calculated using IS EN 14351, IS EN ISO 10077-1 or IS EN ISO 10077-2. The manufacturer/ supplier must provide CE marked or Declaration of Performance for the product with reference to the relevant standards.</p> <p>Film or signage applied to the glass to advertise/ promote services or products is regarded as occupier behaviour and should be ignored for the purposes of the BER assessment.</p> <p>Non-default values should be used where possible.</p> <p>Default values to be used unless acceptable evidence to support non-default values for the U-value, T Solar and L Solar is available.</p> <p>Non-default values must be demonstrated for each of the entries for U-value, T-Solar and L-Solar. Otherwise, a default value should be used for all. Where default values are used, evidence is required to support age of construction and the type of window installed.</p>	<p>The evidence required to use non-default building characteristics (e.g., U-values) are met by the following:</p> <ul style="list-style-type: none"> • “As Built” drawings/ specification for New Final, New Provisional – Shell and Core or Existing BERs detailing the window make and model and copies of certified U-values, solar and light values <p>Or</p> <ul style="list-style-type: none"> • Original installation documentation detailing window make and model can be used if available where it references certified data; <p>And</p> <ul style="list-style-type: none"> • Representative photographs of the window, gap between glazing, manufacturer’s stamp pointing to certified data can be used as supporting evidence. The gap between glazing panes must not include the thickness of the glazing panes • Copies of invoices with technical characteristics of the window clearly identifying that the window relates to the building concerned. • Design drawings/ specification for New Provisional BERs detailing the window make and model and copies of certified U-values, solar and light values <p>In all cases</p> <ul style="list-style-type: none"> • Calculations carried out by a competent person and in a software tool using the appropriate standards. • Confirmation of the glazing type used in the window system must be provided. • The performance of the glass used must be sourced from, A CE-Marked/ Declaration of Performance certificate for the U-value and light & solar transmittance of the glass, or the glass manufacturer’s calculator once that calculator has been validated by an accredited body.

Data Entry Item	Guidance	Documentary Evidence
<p>Curtain Walling, generally a non-structural glazing designed to be weatherproof, often framed in aluminium, which does not support the weight of floors or roof but rather hangs off floor slabs.</p>	<p>Non-default values should be used where possible.</p> <p>Non-default values for U-values, Solar and Light Transmittance values supplied by manufacturers or suppliers are calculated based on the standards outlined in Appendix A of TGD L. The manufacturer/ supplier must provide CE marked or Declaration of Performance for the transparent elements with reference to the relevant standards.</p> <p>A site-specific thermal transmittance calculation should be undertaken by a competent person e.g., façade engineer and calculated in accordance with I.S. EN 12631 taking on board the specific geometry of the installed product/ system.</p> <p>Thermal Bridging factors that are accounted for in the curtain walling system should be set to zero in the applicable zones in iSBEMie. These would typically be lintel, sills, and jambs and potentially wall - wall and wall – floor junctions.</p> <p>For opaque sections of curtain walling or spandrel panels the solar and light transmittance values are set to zero.</p> <p>Default values to be used unless acceptable evidence to support non-default values for the U-value of the curtain wall system, T Solar, and L Solar for the transparent element of the curtain wall system is available. Non-default values must be demonstrated for each of the entries for U-value, T-Solar and L-Solar.</p>	<p>The evidence required to use non-default building characteristics (e.g., U-values) are met by one of the following:</p> <ul style="list-style-type: none"> • “As Built” drawings/ specification for New Final, New Provisional – Shell and Core or Existing BERs detailing the curtain walling make and type and copies of certified U-values, solar and light values <p>Or</p> <ul style="list-style-type: none"> • Original installation documentation from the installer detailing curtain walling make and type can be used if available (to obtain certified data); <p>And</p> <ul style="list-style-type: none"> • Representative photographs of the curtain walling, gap between glazing, manufacturer’s stamp pointing to certified data can be used as supporting evidence. If measuring the gap between glazing panes, ensure that the thickness of the glazing panes is not included in the final glazing gap figure • Design drawings/ specification for New Provisional BERs detailing the curtain walling make and type and copies of certified U-values, solar and light values <p>Copies of invoices with technical characteristics of the curtain walling; invoices must clearly identify that the curtain walling relates to the building concerned.</p>

7.3 iSBEMie Software Tab: “Geometry > Project”

Data Entry Item	Guidance	Documentary Evidence
<p>Building Infiltration</p>	<p>For publication of a BER, use the air permeability default value of 25 m³/h/m² at 50 Pa unless a valid acceptable pressure test certificate is available.</p> <p>For large complex buildings with an envelope area in excess of 160,000m² such as airport terminals, regional hospitals, or large shopping centres where it is not practical to implement a phased pressure testing approach, the alternative approach outlined in Section 5.3 of ATTMA document Technical Standard L2 Measuring Air Permeability of Building Envelopes (Non-Dwellings) may be adopted. Where this has been demonstrated a default of 5 m³/h/m² at 50 Pa may be used.</p> <p>The procedure for testing is specified in I.S. EN ISO 9972: 2015 “Thermal performance of buildings: determination of air permeability of buildings: fan pressurization method”.</p> <p>Detailed guidance on testing procedure is given in ATTMA TSL2 publication “Measuring air permeability of Building Envelopes” and additional guidance is provided in CIBSE Technical Manual TM 23 “Testing Buildings for Air leakage”.</p>	<p>Where a non-default value is used, a copy of the pressure test certificate must be provided with the following details:</p> <ul style="list-style-type: none"> • address of the building • date of the pressure test. • Permeability (air leakage rate in m³/hr divided by envelope area m² at 50 Pascal pressure difference) <p>Reports watermarked as “DRAFT” are not acceptable.</p> <p>Pressure test certificates must declare to be in compliance with I.S. EN ISO 9972: 2015 “Thermal performance of buildings: determination of air permeability of buildings: fan pressurization method” and CIBSE Technical Manual TM23 “Testing Buildings for Air Leakage”.</p> <p>The tests should be carried out by a person certified by an independent third party to carry out this work, e.g., Irish National Accreditation Body or National Standards Authority of Ireland certified or equivalent.</p> <p>For Provisional BER certificates the assessor must have evidence of both of the following:</p> <ul style="list-style-type: none"> • Specification/ Drawing stating Pressure Test shall achieve X m³/m²/hr and • Drawings showing details of air barrier and addressing penetrations and junctions. <p>In the absence of the above evidence for Provisional BERs, the backstop value from TGD L must be used.</p>
<p>Building orientation</p>	<p>The default is set at zero and should only be changed with caution. Refer to Section 3.4.2 of How to use iSBEMie (Volume 2).</p> <p>Check the Data Reflection Report to ensure the rotation is as expected.</p>	<p>Copy of site plan of building with orientation or a photograph of compass in relation to the building.</p> <p>If altered, include a note in the “Location description” field in the building details tab.</p>
<p>Zone Height (Global)</p>	<p>Enter the floor to floor or floor to soffit for top floor. Refer to Appendix 6 of this document. This will then be the default zone height applied to all zones and can be edited at zone level</p>	<p>Building sketches with dimensions, calculations, and a survey form/report or Architectural drawings with dimensions, calculations, and a survey form/report.</p> <p>Building sketches/ architectural drawings should show the depth of all components,</p>

Data Entry Item	Guidance	Documentary Evidence
Maximum number of storeys	Enter the maximum number of storeys in the building.	including floor slabs, floor voids, ceiling voids etc. Building sketches with dimensions, calculations, and a survey form/report or Architectural drawings with dimensions, calculations, and a survey form/report.
Building area	Enter the total floor area of building. Refer to Section 3.4.2.5 of How to use iSBEMie (Volume 2) for details on this item.	No evidence required. Not used in calculation. It is recommended to use this field to help spot errors in entry of zone areas.
Global Thermal bridges	<p>For existing buildings, it is unlikely that sufficient evidence will be obtainable to substantiate the use of non-default thermal bridging values.</p> <p>Where insufficient evidence is available the input fields must be left blank, resulting in default figures being used. As outlined in Section 3.4.2 of How to use iSBEMie (Volume 2), the values visible are further degraded in the calculation process. The values used in the calculation can be accessed from the data reflection report. Refer to Section 4.2.3 of How to use iSBEMie (Volume 2) for details on how to access the report.</p> <p>Non-default thermal bridging values should be used where possible for new buildings.</p>	<p>Where a non-default value is used, acceptable documentary evidence must be provided for the building.</p> <p>Where accredited data is available one of the following must be provided:</p> <ul style="list-style-type: none"> • For psi values from “Limiting Thermal Bridging and Air Infiltration - Acceptable Construction Details” (http://www.environ.ie) as referenced in Appendix D of the Building Regulations TGD L, documentary evidence must be provided that demonstrates that the details have been conformed to. This requires that: <ol style="list-style-type: none"> 1) the relevant drawings clearly show the relevant details and that these details are checked and signed off by the developer/builder, site engineer or architect. 2) As built Plans/ Sections/ Elevation drawings showing all key junction locations and reference to detailed drawing for New Final, New Provisional – Shell and Core and Existing BERs. 3) Design Plans/ Sections/ Elevation drawings showing all key junction locations and reference to detailed drawing for New Provisional BERs. • Certified psi values are used, documentary evidence in accordance with the methods described in IS EN ISO 10211:2017 and BR 497: 2016 must be provided. <p>These calculations of two dimensional or three-dimensional heat flow require the use of numerical modeling software. To be</p>

Data Entry Item	Guidance	Documentary Evidence
		<p>acceptable, numerical modeling software should model the validation examples in IS EN ISO 10211:2017 with results that agree with the stated values of temperature and heat flow within the tolerance indicated in the standard for these examples.</p> <p>Detailed guidance on decisions regarding specific input to the modeling software and the determination of certain quantities from the output of the software is contained in BRE Report BR 497 Conventions for calculating linear thermal transmittance and temperature factors. This guidance should be followed in carrying out modeling work so that different users of the same software package and users of different software packages can obtain correct and consistent results.</p> <p>Certification of the detail by a member of the NSAI Thermal Modellers’ Certification Scheme, certified by a third body such as Agrément or equivalent or from accredited database such as the BRE Certified Thermal Details and Products Scheme is a means of meeting the requirements in TGD L and NEAP for calculation of Ψ values.</p>

7.4 iSBEMie Software Tab: “Geometry > Zones > General”

Data Entry Item	Guidance	Documentary Evidence
Multiplier	Refer to Section 3.4.3.2 of How to use iSBEMie (Volume 2) for details on this item.	The evidence must show that all items to be multiplied are identical. The assessor should document the use of the multiplier so that its use can be understood in the event of an audit. The “User’s note’s” field can assist with this.
HVAC System	<p>The BER is based on non-default HVAC systems where there is sufficient evidence available. As outlined in Section 6 of this document.</p> <p>The use of default HVAC systems is detailed in Appendix 4.3 and Appendix 7 of this document. The appendices deal specifically with the following circumstances:</p> <ul style="list-style-type: none"> • Shell and Core Buildings • No HVAC present in the building/ zone <p>For further detail on default HVAC systems refer to Section 3.4.3 of How to use iSBEMie (Volume 2).</p>	<p>The evidence required in order to use non-default building characteristics is met by one of the following in conjunction with the plantroom survey and ceiling void details:</p> <ul style="list-style-type: none"> • Copy of as built HVAC drawings and specifications for New Final and Existing BERs • Copy of design HVAC drawings and specifications for New Provisional BERs • Copy of technical details from operational and maintenance manuals • Representative photographs of the HVAC system.

Data Entry Item	Guidance	Documentary Evidence
Building Type/ Activity	<p>The activity specified sets default parameters which the tool uses to calculate the energy consumption. These parameters include temperature set points, heat gains from people and equipment, required illuminance, and fresh air requirements amongst others. For details Refer to Section 3.4.3 of How to use iSBEMie (Volume 2).</p> <p>Appendix 3 of this document contains additional information and references.</p>	<p>In combination with the floor-by-floor sketches /architectural drawings marked up to show zones the following should be provided:</p> <ul style="list-style-type: none"> • Photographs • A survey form • Notes on the reason for selecting the particular building type and activity
Area	<p>Floor area of zone. Refer to Section 3.4 Measurement and Other Conventions in How to use iSBEMie (Volume 1) and Section 3.4.3 of How to use iSBEMie (Volume 2).</p>	<p>Floor by floor sketches with dimensions and calculations or Architectural drawings with dimensions and calculations marked up to show zones.</p>
Height	<p>Height of zone can be changed to a different value to that entered globally.</p> <p>Guidance in “Zone Height (Global)” in the previous Section 7.3 of this document applies.</p>	<p>The evidential requirements in “Zone Height (Global)” in the previous section 7.3 of this document applies.</p>
Zone Infiltration	<p>Infiltration can be changed to a different value to that entered globally.</p> <p>Guidance as per “Building Infiltration” in the previous section applies.</p>	<p>Documentary Evidence as per “Building Infiltration”</p> <p>Evidence to show where and why different zones in a building will have differing infiltration values.</p>
Thermal Bridges	<p>Thermal Bridging factors that are accounted for in the curtain walling system should be set to zero in the applicable zones in iSBEMie.</p>	<p>Documentary Evidence as per “Global Thermal Bridges”</p>
User’s Notes	<p>Optional field: Can be used to add information about a zone that it could be better understood by someone viewing the file or to assist the BER assessor with keeping track of the zones.</p> <p>Examples of possible data entry: floor has some overhang, higher section, corner office, merged offices 4 to 6.</p>	<p>No requirement for evidence, but user notes are expected to be consistent with all evidence provided.</p>

7.5 iSBEMie Software Tab: “Geometry > Envelope”

Data Entry Item	Guidance	Documentary Evidence
Name	Refer to Section 3.5 Nomenclature in How to use iSBEMie (Volume 1). for guidance.	Not applicable.
Zone	Zone that envelope element is part of.	Floor by floor sketches with dimensions and survey form or Architectural drawings with dimensions and marked up to show zones and a survey form/report.
Type of Envelope	Choose between wall, floor/ceiling, or roof.	Floor by floor sketches with dimensions and a survey form/report and photographs or Architectural drawings with dimensions and marked up to show zones and a survey form/report and photographs.
Construction	Choose from Constructions set up in Project Database for envelope type.	Floor by floor sketches with dimensions and a survey form/report and photographs or Architectural drawings with dimensions and marked up to show zones and a survey form/report and photographs.
Connects Space to	Choose what conditions apply to the other side of the wall, floor/ceiling, or roof. <u>Refer to Appendix 8 of this document for further guidance.</u>	Floor by floor sketches with dimensions and a survey form/report or Architectural drawings with dimensions and marked up to show zones and a survey form/report.
Orientation	This Specifies the orientation of the envelope element. Select from one of the available options.	Copy of site plan or sketch of building with orientation and photograph of compass in relation to the building.
Area	Area of envelope inclusive of any windows/ doors. Refer to Section 3.4 Measurement and Other Conventions in How to use iSBEMie (Volume 1) for guidance.	Floor by floor sketches with dimensions, calculations and a survey form/report or Architectural drawings with dimensions, calculations and marked up to show zones and a survey form/report.
Perimeter	Enter the horizontal dimension of the wall, as per Section 3.4 Measurement and Other Conventions in How to use iSBEMie (Volume 1) This field becomes active for wall elements only. The default value is based on area of the element divided by the entered zone height. For some wall elements e.g., a gable end wall this calculated value will not be correct and will need to be overridden manually.	Floor by floor sketches with dimensions, calculations, and a survey form/report or Architectural drawings with dimensions, calculations and marked up to show zones and a survey form/report.

Data Entry Item	Guidance	Documentary Evidence
Pitch	<p>Enter pitch angle, in degrees from the horizontal. This field becomes active for “roof” or “floor or ceiling” elements only.</p> <p>The default value for roof is 45° and for floor or ceiling is 0°.</p> <p>A pitched roof has a pitch greater than 10 deg. If the pitch is greater than 70 °, it can be considered a wall. If the roof’s pitch is 10° or less it can be considered flat.</p>	<p>Floor by floor sketches with dimensions, calculations, and a survey form/report or Architectural drawings with dimensions, calculations and marked up to show zones and a survey form/report.</p>
Tick if there is a solar collector on this wall	<p>Tick if there is a solar collector present. This field becomes active for “wall” elements only and where a Solar Collector has been defined.</p>	<p>Guidance as per “Solar Collectors”</p>
Additional Thermal Bridges	<p>Enter additional thermal bridges to those already described in the Thermal Bridges Project or Zone tab. Refer to Section 3.4.7.7 of the iSBEMie User Guide (Volume 2) for guidance on its use.</p>	<p>Documentary Evidence as per “Global Thermal Bridges”</p>

7.6 iSBEMie Software Tab: “Geometry > Doors”

Data Entry Item	Guidance	Documentary Evidence
Name	<p>Refer to Section 3.5 Nomenclature in How to use iSBEMie (Volume 1) for guidance.</p>	<p>Not applicable.</p>
In Envelope	<p>Enter the Envelope where the Door is installed.</p> <p>Note: Doors more than 50% glazed should be entered as a window. Adjust the resulting window frame factor to represent the amount of solid door. The initial value is 0.1 which is too small in many cases.</p> <p>Note: Doors located in internal walls are not entered. The entire wall area is entered as if there were no door.</p> <p>Refer to Section 3.3 in How to use iSBEMie (Volume 2).</p>	<p>Floor by floor sketches with dimensions and a survey form/report or Architectural drawings with dimensions and marked up to show zones and a survey form/report.</p>
Type	<p>Choose between High Usage Entrance, Personnel, and Vehicle Access Doors.</p> <p>Refer to Note 7, Table1 in TGD L.</p>	<p>Floor by floor sketches with doors identified on a survey form/report and photographs. or Architectural drawings with dimensions and marked up to show zones and a survey form/report.</p>

Data Entry Item	Guidance	Documentary Evidence
Construction	Choose from Constructions set up in Project Database for door type.	Floor by floor sketches with doors identified on a survey form and photographs. or Architectural drawings with doors identified and marked up to show zones and a survey form/report and photographs.
Area	Enter the Area of structural opening in wall including frame. Refer to Section 3.4 Measurement and Other Conventions in How to use iSBEMie (Volume 1).	Building sketches with dimensions and a survey form/report or Architectural drawings with dimensions and a survey form/report.

7.7 iSBEMie Software Tab: “Geometry > Windows and Rooflights”

Data Entry Item	Guidance	Documentary Evidence
Name	Refer to Section 3.5 Nomenclature in How to use iSBEMie (Volume 1) for guidance.	Not applicable.
In Envelope	Enter the Envelope that window/rooflight is part of.	Floor by floor sketches with dimensions and a survey form/report or Architectural drawings with dimensions and marked up to show zones and a survey form/report.
Glazing Type	Choose between the glazing types defined in Project Database or default glazing.	Floor by floor sketches with glazing type identified and a survey form/report and photographs. or Architectural drawings with glazing type identified and marked up to show zones and a survey form/report and photographs.
Area	Enter the Area of structural opening in wall/roof including frame. Refer to Section 3.4 Measurement and Other Conventions in How to use iSBEMie (Volume 1) for measurement conventions.	Building sketches with dimensions and a survey form/report or Architectural drawings with dimensions and a survey form/report.
Surface Area Ratio	Enter the ratio of the “developed area to projected area” for the window or rooflight as defined in Section 3.4.5 of How to use iSBEMie (Volume 2). The developed area is the total area of the glass plus frame. The projected area is the area of the opening in the envelope.	Building sketches with dimensions and a survey form/report or Architectural drawings with dimensions and a survey form/report.

Data Entry Item	Guidance	Documentary Evidence
<p>Display Window Tickbox</p>	<p>Tick if the window is a “Display Window”.</p> <p>This is a window intended for the display of products or services on offer within the building, positioned:</p> <ul style="list-style-type: none"> • At external perimeter of the building; and • At an access level and immediately adjacent to a pedestrian thoroughfare. <p>Glazing more than 4m above such an access level or incorporates a fixed or opening light of less than 2m², should not be considered part of the display window except:</p> <ul style="list-style-type: none"> • Where the size of individual products on display require a greater height of glazing • Where changes to the façade requiring planning (including glazing) require a greater height of glazing, e.g., to fit in with surrounding buildings or to match the character of the existing façade. 	<p>Building sketches with dimensions and a survey form/report or Architectural drawings with dimensions and a survey form/report.</p>
<p>Area Ratio Covered</p>	<p>Enter the ratio of the roof area covered by an array of rooflights to the total area of the rooflight glazing. Refer to Section 3.4.5 of How to use iSBEMie (Volume 2) for definition.</p>	<p>Building sketches with dimensions and a survey form/report or Architectural drawings with dimensions and a survey form/report.</p>
<p>Frame Factor</p>	<p>Enter the ratio of the window or rooflight area which is occupied by the frame to the total window or rooflight area.</p> <p>The default value is 0.1 for a window (i.e., 10% of the total area is occupied by the frame and 90% by the glazing) and 0.3 for a rooflight.</p> <p>Note: This will impact on solar gain.</p> <p>Refer to Section 3.4.5 of How to use iSBEMie (Volume 2) for definition.</p>	<p>Building sketches with dimensions and a survey form/report or Architectural drawings with dimensions and a survey form/report or Window manufacturers technical data sheets and declarations for installed window system in specific building</p>
<p>Aspect Ratio</p>	<p>Enter the ratio of a windows height to the windows width. (i.e., window height / window width)</p> <p>Note: This will impact on the thermal bridging calculations for the Lintel, Sill, and Jamb lengths.</p> <p>The default value is 0.7.</p> <p>Refer to Section 3.4.5 of How to use iSBEMie (Volume 2) for definition.</p>	<p>Building sketches with dimensions and a survey form/report or Architectural drawings with dimensions and a survey form/report or Window manufacturers technical data sheets and declarations for installed window system in specific building</p>

Data Entry Item	Guidance	Documentary Evidence
Shading position	<p>Choose from None (no shading), Internal or External based on the presence of movable solar shading device. Refer to Section 3.4.5 of How to use iSBEMie (Volume 2) for definition.</p>	<p>Building sketches or a survey form/report and photographs or Architectural drawings and a survey form/report and photographs.</p>
Shading colour	<p>Choose the colour of the movable solar shading device from Black, Dark, Pastel or White. Refer to Section 3.4.5 of How to use iSBEMie Compliance Assessment for definition.</p>	<p>Building sketches or a survey form/report and photographs or Architectural drawings and a survey form/report and photographs. or Solar Shading manufacturers technical data sheets and declarations for installed system in specific building</p>
Shading translucency	<p>Choose the translucency of the movable solar shading device from High translucent, Medium translucent or Opaque.</p> <p>Opaque = 0% transmittance Medium Translucent = 20% transmittance High Translucent = 40% transmittance</p> <p>Refer to Section 3.4.5 of How to use iSBEMie (Volume 2) for definition.</p>	<p>Building sketches or a survey form/report and photographs or Architectural drawings and a survey form/report and photographs. or Solar Shading manufacturers technical data sheets and declarations for installed system in specific building</p>
Transmission Factor	<p>This is the fraction of light transmitted through that specific window after accounting for shading from overhangs and fins. For details on how to calculate the transmission factor, see Section 3.4.6: Transmission Correction Factors of How to use iSBEMie (Volume 2).</p>	<p>Building sketches with dimensions and a survey form/report and photographs or Architectural drawings with dimensions and a survey form/report and photographs.</p>
Brise-Soleil Tickbox	<p>Tick this box if the overhang whose transmission factor is accounted for in the previous parameter is in fact a brise-soleil. Brise-Soleil for iSBEMie can be strips, louvres, holes etc., as opposed to solid overhang attached to the building exterior. Refer to Section 3.4.5 of How to use How to use iSBEMie (Volume 2) for definition.</p>	<p>Building sketches with dimensions and photographs or Architectural drawings with dimensions and photographs or Solar Shading manufacturers technical data sheets and declarations for installed system in specific building.</p>

7.8 iSBEMie Software Tab: “Building Services > Global and Defaults > HVAC System Defaults”.

Data Entry Item	Guidance	Documentary Evidence
HVAC System Defaults	<p>Refer to Appendix A4.2 of this document for details on default HVAC system entry.</p> <p>Default systems are only used where actual systems do not exist or are incomplete. (See Section 4.8 of this document for guidance on non-operational and missing equipment.)</p> <p>Where actual systems exist, they are defined as per iSBEMie Software Tab: “Building Services > HVAC Systems > General” as described later in this document.</p> <p><u>This sub-tab is not available for a Part L only assessment.</u></p>	<p>The basis for selecting a default system must be documented and retained together with supporting information.</p> <p>Building sketches with dimensions and a survey form/report and photographs</p> <p>Photographs of areas where default systems are to be allocated.</p> <p>As Built drawings and specifications for New Final and Existing BERs.</p> <p>Design drawings and specifications for Existing BERs.</p>

7.9 iSBEMie Software Tab: “Building Services > Global and Defaults > Project Building Services”.

Data Entry Item	Guidance	Documentary Evidence
Is the lighting separately metered?	<p>Answering “yes” to this input would require the Assessor to obtain formal confirmation that the lighting is separately metered.</p>	<p>The evidence required in order to answer “Yes” is met by all of the following (as applicable):</p> <ul style="list-style-type: none"> • For New Provisional BERs, a copy of Design electrical schematics showing meters. • For New Final and Existing BERs, a copy of As Built electrical schematics showing meters; • Photograph of sub-meter permanently labelled showing it is for lighting. • Letter from an electrical contractor advising that they have checked the system in the last 12 months and confirming that it is separately metered.
M&T with alarm for “out of range” values?	<p>The Assessor must ascertain if such a system is installed, M&T system must have alarm for “Out of Range” values.</p>	<p>For New Final or Existing BERs, the evidence required is details of M&T system from operational and maintenance manuals. Review the BMS to ensure that the system is in operation or review records for previous 12 months.</p> <p>For New Provisional BERs specification of the BMS/ BEMS should be provided demonstrating its proposed inclusion.</p>

Data Entry Item	Guidance	Documentary Evidence
Electricity Power Factor	<p>The default power factor value of <0.9 must be used in an existing building unless analysis of the recent 12 month’s bill data indicates a different value.</p> <p>The default power factor value of <0.9 must be used in a new building unless one of the following is demonstrated:</p> <ol style="list-style-type: none"> 1) A power factor of >0.95 can be used in a new building where there is adequate documentary evidence to support the installation of power factor correction equipment within the building for final certificates and the proposed installation of power factor correction equipment for provisional certificates. 2) A non-default power factor can be used for a Final BER in a new building where a suitably qualified electrical engineer has produced a report detailing the expected power factor for the building as constructed. 3) A non-default power factor can be used for a Provisional BER in a new building where a suitably qualified electrical engineer has produced a report detailing the expected power factor for the building as per the design. 	<p>Electricity utility bills for 12-month period prior to assessment of an existing building which show that the power factor was kept above 0.9 or 0.95.</p> <p>For a new building, detail of installed power factor correction equipment or a signed report from a suitably qualified electrical engineer.</p>

Data Entry Item	Guidance	Documentary Evidence
<p>Has LENI calculation been carried out?</p> <p>Part L assessments only.</p>	<p>This field is only active for a Part L compliance check.</p> <p>Answering “yes” to this input confirms that a Lighting Numerical Indicator (LENI) method has been carried out for the building as an alternative to complying with the lighting efficacy standards specified in Part L. This will be reported in the BRIRL output document.</p> <p>Note: The lighting energy calculation in iSBEMie is not affected by this data entry item.</p>	<p>The evidence required in order to answer “Yes” is met by a signed statement from a suitably qualified engineer from the consultants responsible for the lighting design showing:</p> <ul style="list-style-type: none"> • LENI Calculations in compliance with Appendix F of TGD L of the Building Regulations. • As Built Specification and Drawings for New Final BER • Design Specification and Drawings for New Provisional BER
<p>Process Energy for RER: Primary Energy Exported</p> <p>Part L assessments only.</p>	<p>This field allows entry of a figure for total process primary energy exported annually contributing to the Renewable Energy Ratio for Part L compliance.</p> <p>Note: It does not impact on the energy and carbon performance compliance requirements or the Building Energy Rating.</p> <p>The process energy should not be accounted for in the regulated loads included in the NEAP methodology.</p> <p>Example: The heat from a heat pump or CHP may be used to supply a process. Any surplus heat used in the building will contain a renewable contribution, which would be entered here. Other renewable technologies may also qualify.</p>	<p>For new buildings, a report from a suitably qualified member of the design team, detailing how the renewable primary energy exported has been calculated.</p> <p>The report should be submitted for review to SEAI/ DHLGH prior to inclusion in the NEAP methodology.</p>

Data Entry Item	Guidance	Documentary Evidence
<p>Process Energy for RER: Primary Energy used.</p> <p>Part L assessments only.</p>	<p>This field allows entry of a figure for total process primary energy used annually contributing to the Renewable Energy Ratio for Part L compliance.</p> <p>Note: It does not impact on the energy and carbon performance compliance requirements or the Building Energy Rating.</p> <p>The process energy should not be accounted for in the regulated loads included in the NEAP methodology.</p> <p>Example: The heat from a heat pump or CHP may be used to supply a process. The primary energy associated with the surplus heat used in the building would be entered here. Other renewable technologies may also qualify.</p>	<p>For new buildings, a report from a suitably qualified member of the design team, detailing how the renewable primary energy used has been calculated.</p> <p>The report should be submitted for review to SEAI/ DHLGH prior to inclusion in the NEAP methodology.</p>
<p>District Heating Parameters</p>	<p>District Heating is intended as a central system serving multiple buildings from <u>a system outside the boundaries of the site</u>.</p> <p>A calculation methodology is currently under development to calculate primary energy and CO2 emission factors for specific district heating systems, on the basis of verified data and in line with EN 15316-4-5.</p> <p>Default factors must be used if District Heating is selected as the heat source until the calculation methodology has been implemented. More information on default factors to be used can be found in Appendix 12 of this document and in District Heating guidance published on the SEAI website.</p>	<p>A recent bill or documentary evidence from the district heating provider for the property address is required to confirm the connection to a district heating system.</p> <p>Additional evidence required for the use of default factors approved for specific Schemes must be kept on file.</p>

7.10 iSBEMie Software Tab: “Building Services > HVAC Systems > General”.

Data Entry Item	Guidance	Documentary Evidence
Type	<p>Select from the Building Services Type options in Database for Building Services. Follow guidance in Section 3.5.2 of How to use iSBEMie (Volume 2).</p> <p>Categorising the HVAC system is an important aspect of BER production because such systems account for the major proportion of energy used in a building. The Assessor must be familiar with the various types of HVAC systems as categorised in Table 7 of How to use iSBEMie (Volume 2).</p> <p>The Assessor must be capable of categorising the system based on the limited information available on site.</p>	<p>For New Final and Existing BERs, in conjunction with the plantroom survey details and ceiling void details the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of air handling units, ducting, associated equipment in ceiling voids, heater/cooling batteries, fresh air intakes, discharge grilles, actuated dampers, etc • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications. <p>For New Provisional BERs, design drawings, specifications and technical data sheets must be provided.</p> <p>The basis for categorising a system must be documented and retained together with supporting information.</p>
Heat Source	<p>Select from the Heating Sources options in the database</p>	<p>For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of heat source plant (e.g., boiler nameplates and manufacturer name); • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications. <p>For New Provisional BERs, design drawings, specifications and technical data sheets must be provided.</p>
Fuel Type	<p>Select from the Fuel Types</p> <p>For further guidance on the selection of solid fuel types refer to Appendix 10 of this document.</p>	<p>For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of heat source plant (e.g., boiler nameplates and manufacturer name), fuel meter or fuel store • Copies of technical data sheets from operational and maintenance manuals • As built drawings and specifications. <p>For New Provisional BERs, design drawings, specifications and technical data sheets must be provided.</p>

Data Entry Item	Guidance	Documentary Evidence
<p>Tick if this system also uses CHP</p>	<p>The Assessor must ascertain if the heating system derives its heat, or part of it, from a combined heat and power system. When this is ticked in iSBEMie, a new tab opens, "CHP generator".</p>	<p>For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by at least one of the following:</p> <ul style="list-style-type: none"> • Photographs of CHP plant with nameplates and manufacturer name • Copies of technical data sheets from operational and maintenance manuals • As built drawings and specifications. <p>For New Provisional BERs, design drawings, specifications and technical data sheets must be provided.</p>
<p>Cooling System Generator Type</p>	<p>Select from the Generator Types options in the database.</p>	<p>For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of cooling plant (e.g., chiller nameplates and manufacturer name) • Copies of technical data sheets from operational and maintenance manuals • As built drawings and specifications. <p>For New Provisional BERs, design drawings, specifications and technical data sheets must be provided.</p>
<p>Ventilation - Heat Recovery</p>	<p>The heat recovery system may be incorporated within the air handling unit(s) or it may be external. The Assessor must establish whether or not heat recovery is fitted and then select the type of heat recovery equipment.</p>	<p>For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of heat recovery unit • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications. <p>For New Provisional BERs, design drawings and specifications.</p>
<p>Tick if variable heat recovery efficiency</p>	<p>Tick box if documentary evidence is available to show that the heat recovery system can be bypassed or switched off in summer.</p>	<p>For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of bypass/ controls • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications. <p>For New Provisional BERs, design drawings and specifications.</p>

Data Entry Item	Guidance	Documentary Evidence
Heat Recovery Seasonal Efficiency	<p>If known, the heat recovery efficiency can be introduced manually into the interface.</p> <p>The value is based on the “dry heat recovery efficiency” / “temperature heat recovery efficiency”. Non-default efficiency values must be in compliance with the Commission Regulation (EU) 1253/2014 with regard to EcoDesign requirements for ventilation units.</p> <p>Non-default efficiencies may be obtained from the following sources:</p> <ul style="list-style-type: none"> • Performance data on “CE marked” literature is acceptable provided that the literature refers to the relevant test performance standard. • Literature from manufacturer referencing the efficiency and relevant Ecodesign standard. • Accredited Test certificates to the relevant test performance standard <p>Refer to Section 0 for more information.</p> <p>The default value must be used for efficiency if there is no documentary evidence to substantiate non-default entries.</p> <p>A non-default value should be used where possible.</p>	<p>For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by the following:</p> <ul style="list-style-type: none"> • Photographs of heat recovery unit • Copies of technical data sheets from operational and maintenance manuals • Sources of efficiency as outlined in “Guidance” and Section 6.1 • As Built drawings and specifications. <p>For New Provisional BERs, design drawings, specifications and sources of efficiency as outlined in “Guidance” and Section 6.1.</p> <p>Note: Where commissioning results are available the heat recovery efficiency is based on the flow rate at the highest setting, where the equipment has variable speed settings. Otherwise, the heat recovery efficiency is based on the nominal or 100% flow rate of the equipment.</p>

7.11 iSBEMie Software Tab: “Building Services > HVAC Systems > Heating”.

Data Entry Item	Guidance	Documentary Evidence
Does it qualify for UK ECAs? Active when LTHW boilers or ground & water source heat pumps are selected as the heat source.	<p>Ticking this box will improve the default efficiency.</p> <p>Check the equipment concerned at http://www.SEAI.ie/Your Business/Accelerated Capital Allowance</p> <p>Or the UK equivalent https://etl.beis.gov.uk/engetl/fox/live/ETL PUBLIC PRODUCT SEARCH</p>	<p>Take note of the specific equipment make and model number and show corresponding details on ACA webpage (or ECA now called ETL, the UK equivalent). Include a snapshot or a download of the relevant page from the website. A web link to the page is not acceptable since it may expire.</p> <p>ETL allows the user to receive an automated email with the product listing. ACA can generate an Excel file with the product listing. Both are acceptable as supporting evidence for this entry.</p>

Data Entry Item	Guidance	Documentary Evidence
<p>Was it installed in or after 1998?</p> <p>Active only when LTHW boilers are selected as the heat source.</p>	<p>Answering “yes” to this input changes the default heating efficiency from 0.65 to 0.81.</p> <p>Answering “yes” to this input requires the Assessor to obtain documentary evidence to substantiate date of construction of the building or date of installation of the boiler.</p>	<p>The evidence required is met by one of the following:</p> <ul style="list-style-type: none">• Refer to documentary evidence from Age of Building• Operational and maintenance manuals demonstrating the installation date.• Photographs of HWS plant nameplates showing year of manufacture• As Built drawings and specifications.

Data Entry Item	Guidance	Documentary Evidence
<p>Do you know the effective heat generating seasonal efficiency?</p>	<p>It is important to note that there is a difference between the “full load” efficiency of a boiler, the “gross seasonal” efficiency and the “Effective Heat Generating Seasonal Efficiency” as required in iSBEMie.</p> <p>Refer to Appendix 5 of this document for further guidance on the effective heat generating seasonal efficiency to be used and the data sources.</p> <p>Non-default efficiencies may be obtained as per Section 0 of this document.</p> <p>The Assessor should use default values only if it is not possible to obtain the heating source efficiency data required.</p> <p>Note: Boiler efficiency is entered as a decimal. A non-default user figure of e.g., 92% is entered as 0.92. If the figure is entered incorrectly as 92 the software will warn the user with a message in red adjacent to the entered figure “Warning efficiency seems high. Are you sure?” This must be corrected by the user before publication.</p> <p>For radiant heaters, the Heat Generator Seasonal Efficiency is equivalent to its thermal efficiency (gross calorific value basis).</p> <p>For flued appliances the thermal efficiency of the radiant heater will be stated by the manufacturer of the radiant heater having been measured according to the test standards EN 1020 or EN 13842 as applicable. The procedures in EN 1020 and EN 13842 yield a net efficiency - this must be converted to a gross efficiency.</p> <p>Refer to Appendix 5 of this document for net to gross conversion factors.</p>	<p>In conjunction with the plantroom survey details, the evidence required is met by the following:</p> <ul style="list-style-type: none"> • Photographs of heat source plant (e.g., boiler nameplates and manufacturer name) and manufacturer’s data sheets • Copies of technical data sheets from the manufacturer in compliance with sources of efficiency as outlined in Appendix 5 of this document. • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs

Data Entry Item	Guidance	Documentary Evidence
Do you know the generator radiant efficiency?	<p>This field is only active for radiant based heating systems.</p> <p>This refers to the ratio of radiant heat output to energy input.</p>	<p>The evidence required is met by the following:</p> <ul style="list-style-type: none"> • Photographs of heat source plant (e.g., nameplates and manufacturer name) and manufacturer’s data sheets • Copies of technical data sheets from the manufacturer in compliance with sources of efficiency as outlined in Section 6.1 of this document • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs
Do you know the ratio of fan power to heating output?	<p>This field is only active for local fan assisted heating systems where “Central heating using water: convectors” or “Other local room heater – fanned” has been selected as the HVAC system.</p> <p>Enter the fan power of integral fans, in W per kW heat output by the heating system.</p>	<p>The evidence required is met by the following:</p> <ul style="list-style-type: none"> • Photographs of fan assisted heaters nameplates and manufacturer’s data sheets • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs.
Tick if this system also uses CHP	Refer to previous section <u>“Building Services > HVAC Systems > General”</u>	Refer to previous section <u>“Building Services > HVAC Systems > General”</u>

7.12 iSBEMie Software Tab: “Building Services > HVAC Systems > Cooling”.

Data Entry Item	Guidance	Documentary Evidence
Generator kW	Select the cooling generator nominal electrical power.	<p>In conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of cooling plant (e.g., chiller nameplates and manufacturer name) and manufacturer’s data sheet • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs.

Data Entry Item	Guidance	Documentary Evidence
Fuel Type	Select from the Fuel Types	<p>In conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of cooling plant (e.g., chiller nameplates and manufacturer name) and manufacturer’s data sheet • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs.
Does it qualify for UK ECAs?	<p>Ticking this box will improve the default efficiency. However, if equipment is listed the efficiency values are normally presented and so entered directly.</p> <p>Check the equipment concerned at http://www.SEAI.ie/Your Business/Accelerated Capital Allowance</p> <p>Or the UK equivalent https://etl.beis.gov.uk/engetl/fox/live/ETL PUBLIC PRODUCT SEARCH.</p> <p>The above websites provide a useful resource for non-default efficiency values for a range of plant.</p>	<p>Take note of the specific equipment make and model number and show corresponding details on ACA webpage (or ECA now called ETL, the UK equivalent). Include a snapshot or a download of the relevant page from the website. A web link to the page is not acceptable since it may expire.</p> <p>ETL allows the user to receive an automated email with the product listing. ACA can generate an Excel file with the product listing. Both are acceptable as supporting evidence for this entry.</p>
Do you know the generator seasonal energy efficiency ratio (SEER)?	<p>Refer to Appendix 5 of this document for further guidance on the seasonal energy efficiency ratio (SEER) to be used.</p> <p>Non-default efficiencies may be obtained as per Section 6.1 of this document.</p> <p>The Assessor should use default values only if it is not possible to obtain the cooling plant efficiency data required and should have evidence to substantiate this, such as correspondence from chiller manufacturer stating that efficiency is not available.</p>	<p>In conjunction with the plantroom survey details, the evidence required is met by the following:</p> <ul style="list-style-type: none"> • Photographs of cooling plant (e.g., chiller nameplates and manufacturer name) and manufacturer’s data sheet • Copies of technical data sheets from the manufacturer in compliance with sources of efficiency as outlined in Section 6.1 of this document • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs.

Data Entry Item	Guidance	Documentary Evidence
<p>Do you know the generator nominal energy efficiency ratio (EER)?</p>	<p>Please note that in this guide the term “Energy Efficiency Ratio (EER)” has the same meaning as the “Nominal Energy Efficiency Ratio (EER)” used in iSBEMie. Non-default efficiencies may be obtained from the following sources:</p> <ul style="list-style-type: none"> • Performance data on “CE marked” literature is acceptable provided that the literature refers to the relevant test performance standard. • Literature from manufacturer referencing the efficiency and relevant Ecodesign standard. • Accredited Test certificates to the relevant test performance standard. • ECA/ ACA websites, where technology has been tested to the relevant test performance standard. • Eurovent website, where technology has been tested to the relevant test performance standard. <p>The Assessor should use default values only if it is not possible to obtain the cooling plant efficiency data required and should have evidence to substantiate this, such as correspondence from chiller manufacturer stating that efficiency is not available.</p>	<p>In conjunction with the plantroom survey details, the evidence required is met by the following:</p> <ul style="list-style-type: none"> • Photographs of cooling plant (e.g., chiller nameplates and manufacturer name) and manufacturer’s data sheet • Copies of technical data sheets from the manufacturer in compliance with sources of efficiency as outlined in “Section 6.1 of this document • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs.
<p>Tick box to indicate if the HVAC system uses a mixed mode cooling operation</p>	<p>To tick the box the assessor must have documentary evidence to support:</p> <ul style="list-style-type: none"> • Natural ventilation from operable windows is present. • Mechanical cooling is present. • Control of cooling to be linked to window opening using magnetic sensors or other such device to disable cooling when windows are opened 	<p>In conjunction with the survey details, the evidence required is met by the following:</p> <ul style="list-style-type: none"> • Photographs of cooling plant and operable windows within the building. • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs.

7.13 iSBEMie Software Tab: “Building Services > HVAC Systems > System Adjustment”.

Data Entry Item	Guidance	Documentary Evidence
Has the ductwork been leakage tested?	<p>Non-default classification leakage may be obtained from the following sources:</p> <ul style="list-style-type: none"> • Test data in compliance with B&ES DW/143 and B&ES DW/144 identifying the Class of leakage. • Specifications in compliance with EN standards such as IS EN 1507:2006, IS EN 12237:2003 and IS EN 13403:2003. 	<p>The evidence required is met by the following:</p> <ul style="list-style-type: none"> • Copy of Test Certificates from test on site, test must be carried out to CEN standards for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs.
Does the AHU meet CEN leakage standards?	<p>Non-default classification leakage may be obtained from the following sources:</p> <ul style="list-style-type: none"> • Test data in compliance IS EN 1886:2007. • Specifications in compliance with EN standards such as IS EN 1886:2007 	<p>The evidence required is met by the following:</p> <ul style="list-style-type: none"> • Copy of Test Certificates, test must be carried out to CEN standards for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs.
Do you know the specific fan power (SFP)?	<p>The SFP must be calculated in accordance with the calculation procedure set out in IS EN 13779:2007 Annex D and the current edition of TGD L – Buildings Other than Dwellings published on the gov.ie website.</p> <p>Non-default efficiencies may be obtained from the following sources:</p> <ul style="list-style-type: none"> • Performance data on “CE marked” literature is acceptable provided that the literature refers to the relevant test performance standard. • Literature from manufacturer referencing the efficiency and relevant test performance standard. • Accredited Test certificates to the relevant test performance standard. 	<p>The evidence required is met by the following:</p> <ul style="list-style-type: none"> • Photographs of fan nameplates and manufacturer’s data sheets • Copies of technical data sheets from the manufacturer in compliance with sources of efficiency as outlined in Section 6.1 • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs • Calculations of SFP must be retained as evidence. <p>Refer to Appendix 5.4 of this document for an example calculation and for detail on the acceptable form of SFP.</p>

Data Entry Item	Guidance	Documentary Evidence
<p>Presence and Type of Variable Speed Pump</p>	<p>The Assessor must examine the LTHW and CHW circulating pumps to determine if they are variable speed type. Manufacturer’s data sheets should assist in this regard.</p> <p>Where Variable Speed Pumps are present, the assessor must determine the type of sensors present. In larger systems the sensor(s) may be remote from the pump(s). Drawings and operational & maintenance manuals will be needed to verify this sort of arrangement.</p> <p>If pumps are variable speed, the default sensor is “With differential sensor across pump”.</p>	<p>In conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of pumps and manufacturer’s data sheets • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs

7.14 iSBEMie Software Tab: “Building Services > HVAC Systems > Metering Provision”.

Data Entry Item	Guidance	Documentary Evidence
<p>Is this HVAC System separately sub-metered?</p>	<p>Answering “yes” to this input requires the Assessor to obtain documentary evidence demonstrating that the HVAC is separately metered.</p> <p>Note: The HVAC system must be metered separately to other uses within the building. For example, a chiller and AHU must be metered separately to Lighting/ Plug in loads. Similarly, a gas fired heating source must be metered separately to gas used for cooking.</p>	<p>The evidence required to answer “Yes” is met by one of the following:</p> <ul style="list-style-type: none"> • Copy of As Built electrical schematics showing meters for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs • Letter from an electrical contractor advising that he has checked the system in the last 12 months and confirming that it is separately metered.
<p>M&T with alarm for “out of range” values?</p>	<p>Answering “yes” to this input requires the Assessor to ascertain if such a system is installed, M&T system must have alarm for “Out of Range” values.</p> <p>A reduction in energy consumption will only be applied when “yes” is selected for both sub-metering (above) and this item.</p>	<ul style="list-style-type: none"> • The evidence required is details of M&T system from operational and maintenance manuals. Review the BMS to ensure that the system is in operation and/or review records for previous 12 months. • Design drawings and specifications for New Provisional BERs

7.15 iSBEMie Software Tab: “Building Services > HVAC Systems > System Controls”.

Data Entry Item	Guidance	Documentary Evidence
<p>Tick boxes where the listed controls are present</p>	<p>Ticking boxes indicates that the relevant control measure is in place. Ticking a box alone will not alter the calculated efficiency of the relevant HVAC system. Changes to the system efficiency are calculated separately based on the application of heating efficiency credits (where allowed) as described in the “iSBEMie Software Tab: “Building Services > HVAC Systems > Heating” section of this document.</p> <p><u>Note 1: Ticking of a box will remove the relevant upgrade recommendation from the advisory report.</u></p> <p><u>Note 2: Each defined HVAC will have its own set of tick boxes. Refer to Appendix 5 of this document for information on application of credits based on their use.</u></p>	<p>In conjunction with the plantroom survey details, the evidence required is met by the following:</p> <ul style="list-style-type: none"> • Photographs of heat source plant (e.g., boiler nameplates and manufacturer name) and manufacturer’s data sheets • Photographs of the system controls • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications

7.16 iSBEMie Software Tab: “Building Services > HVAC Systems > Bi-valent Systems”.

Data Entry Item	Guidance	Documentary Evidence
<p>System details and percentage load for bi-valent heating systems</p>	<p><u>This field assists assessors with bi-valent and multi-valent system entry. Where a bi-valent or multi-valent system exists the additional system(s) to make a defined HVAC bi-valent or multi-valent can be entered here.</u></p> <p>Refer to the end of section A4.2 of this document for guidance on the default percentage loads to assign.</p> <p>Note 1: Any user-defined HVAC can have a bi-valent aspect added to it. In the case of a building with more than one user-defined HVAC, ensure the “Record selector” field at the top of the bi-valent tab relates to the correct HVAC.</p> <p>Note 2 : Where a system with cooling forms part of a Bivalent system, always enter this system on the regular HVAC tab before entering the other HVAC in the bivalent tab. This is because there is no cooling input in the bivalent tab.</p> <p>Note 3: Where there are two systems in a zone, but it is known that one system is cooling only then follow the guidance on page 68 of the iSBEMie User Guide Vol2 Compliance on how to enter this sort of combination. This is not a bivalent system.</p> <p>Note 4: To delete an unwanted entry in the bi-valent list, select desired entry and press the delete button on your keyboard.</p>	<p>In conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of heat source plant (e.g., boiler nameplates and manufacturer name) and manufacturer’s data sheets • Copies of technical data sheets from the manufacturer in compliance with sources of efficiency as outlined in Section 6.1 of this document • As Built drawings and specifications for New Final BERs • Design drawings and specifications for New Provisional BERs • Refer to the end of section A4.2 of this document for guidance on the default percentage loads to assign.

7.17 iSBEMie Software Tab: “Building Services > HWS”.

Data Entry Item	Guidance	Documentary Evidence
<p>Generator Type</p>	<p>Select from the Generator Types.</p> <p>In the case of multiple tenants/premises in a building:</p> <ul style="list-style-type: none"> Where the hot water services are supplied to each tenant by a central water heating system, (e.g., from the landlord to the tenant’s premises) the efficiency and storage volume should be based on the details of that central system. Where this information is not available default data must be used. <p>In the case where more than one HWS serves a building:</p> <p>If the hot water systems can be allocated by block, such as an extension to the building, enter each individual system and assign to the relevant zones.</p> <p>If there is insufficient data on the allocation of the hot water systems the BER assessor should allocate the systems to the zones that are most likely to be served by them. Try to allocate each system to at least one non-transient zone so that it will be included in the calculation.</p> <p>Refer to Appendix A4.3 of this document for guidance on default system entry or when there is no hot water system present in the building.</p>	<p>In conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> Photographs of HWS plant (e.g., boiler nameplates and manufacturer name) Copies of technical data sheets from operational and maintenance manuals As Built drawings and specifications for New Final or Existing BERs Design drawings and specifications for New Provisional BERs
<p>Tick if the generator is later than 1998</p>	<p>Answering “yes” to this input will improve the default efficiency value of the hot water generator.</p> <p>Answering “yes” to this input requires the Assessor to obtain documentary evidence to substantiate date of construction of the building or date of any remedial work carried out.</p>	<p>The evidence required is met by one of the following:</p> <ul style="list-style-type: none"> Refer to documentary evidence from Age of Building Operational and maintenance manuals demonstrating the installed date. Photographs of HWS plant nameplates showing year of manufacture As Built drawings and specifications.

Data Entry Item	Guidance	Documentary Evidence
Fuel Type	<p>Select from the Fuel Types</p> <p>For further guidance on the selection of solid fuel types refer to Appendix 10 of this document.</p>	<p>In conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of HWS plant (e.g., boiler nameplates and manufacturer name) and manufacturer’s data sheet • Photographs of fuel meter or fuel store • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications.
Do you know the effective heat generating seasonal efficiency?	<p>Default values should only be used if it is not possible to obtain the HWS plant efficiency data.</p> <p>Non-default efficiencies may be obtained from the following sources:</p> <ul style="list-style-type: none"> • Performance data on “CE marked” literature is acceptable provided that the literature refers to the relevant test performance standard. • Literature from manufacturer referencing the efficiency and relevant Ecodesign standard. • Accredited Test certificates to the relevant standard. • ECA/ ACA websites, where technology has been tested to the relevant test performance standard. • <u>Refer to Appendix A5.2 of this document for guidance on Heat Pump efficiencies used for hot water generation.</u> 	<p>In conjunction with the plantroom survey details, the evidence required is met by the following:</p> <ul style="list-style-type: none"> • Photographs of HWS plant (e.g., boiler nameplates and manufacturer name) and manufacturer’s data sheet • Copies of technical data sheets from the manufacturer in compliance with sources of efficiency as outlined in Section 6.1 of this document • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs <p><u>Note: Where a heat pump provides both heating and hot water “Heat Pump” should be selected and NOT as “same as HVAC.” The efficiency will differ between space heating and hot water generation and so selecting “Heat Pump” will allow a separate efficiency to be entered.</u></p> <p>Refer to Appendix A5.2 of this document for details.</p>
Is the system a storage system	<p>The Assessor must ascertain if the HWS system has storage vessel(s). If SES (Solar Energy System) is applied to the Hot Water System, it is assumed that hot water storage exists.</p>	<p>In conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of HWS Cylinder and nameplates and manufacturer name; and manufacturer’s data sheet • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs;

Data Entry Item	Guidance	Documentary Evidence
<p>Storage Volume/ Storage Losses</p>	<p>iSBEMie requires storage losses to be entered in MJ/month or by entering insulation parameters.</p> <p>If the storage losses in MJ/month are unknown the storage volume, insulation type and thickness are entered. If no values are entered, iSBEMie uses default values.</p> <p>Where storage volume is not available from other sources, and storage is accessible, measure the storage vessel. Refer to Appendix 9 of this document for an example calculation on obtaining a MJ/month figure and an example of hot water storage volume calculation.</p> <p>The Assessor should use default values only if it is not possible to obtain the HWS plant data or measure volume on site and should have evidence to substantiate this.</p> <p>Where storage insulation details are not available from other sources, and insulation is accessible, estimate insulation depth by measuring its thickness (e.g., using a pin). Default hot water cylinder insulation thicknesses in Appendix A4.3 of this document is used if insulation is inaccessible.</p>	<p>In conjunction with the plantroom survey details, the evidence required is met by the following:</p> <ul style="list-style-type: none"> • Photographs of HWS Cylinder and nameplates and manufacturer name and manufacturer’s data sheet • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs • Hot water storage volume measured on site (and evidence of any calculations retained by the Assessor)
<p>Does the System have Secondary Circulation</p>	<p>The Assessor must ascertain if the HWS system has secondary circulation.</p> <p>After ticking the box for secondary circulation, three data fields become active. Assessors can enter non-default values for just one or up to all three of the data fields.</p> <p>Buildings such as schools, healthcare, gyms, and large buildings, <u>with centralised hot water systems</u>, are very likely to have secondary circulation. This is for Legionella prevention and to ensure consistent outlet temperature.</p> <p>A dedicated circulation pump will be required as well as associated controls. For existing buildings check any valve charts and control panels in plant rooms for evidence of its inclusion.</p>	<p>In conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of secondary pipework and pump(s), valve charts, control panels • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs <p>N/A where buildings use local point-of-use electric water heaters.</p>

Data Entry Item	Guidance	Documentary Evidence
<p>Circulation Losses/ Pump Power/ Loop Length</p>	<p>Refer to Appendix 9 of this document for guidance for calculating the circulation losses.</p> <p>The pump power may be read from the pump data plate or from a pump data sheet, often called P1.</p> <p>Loop length is the length of the hot water distribution pipework, both flow and return, excluding deadlegs. If no values are entered, iSBEMie automatically calculates default values.</p> <p>Some third-party software does not calculate default values for circulation losses, loop length and pump power. The circulation losses default to be used is 15W/m. Values for the other two fields can be calculated using the iSBEMie Technical Manual Section 4.3.2.</p> <p>Appendix G of TGD L lists maximum allowable heat losses for pipework required to comply with Building Regulations</p>	<p>In conjunction with the plantroom survey details, the evidence required is met by the following:</p> <ul style="list-style-type: none"> • Photographs of HWS pump(s) and nameplates and manufacturer name and manufacturer’s data sheet • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs • Heat Loss calculations from pipework in compliance with EN ISO 12241:2008.
<p>Tick if there is Time Control on Secondary Circulation</p>	<p>The Assessor must ascertain if the HWS system has time control on secondary circulation.</p>	<p>In conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of secondary time controls • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs
<p>Bi-valent sub-tab</p>	<p>A bi-valent or multi-valent system may be defined for a HWS if required. A bi-valent system occurs where a hot water vessel is heated by two heat sources.</p> <p>Refer to iSBEMie Software Tab: “Building Services > HVAC Systems > Bi-valent Systems”.</p> <p>In this document for details on system entry.</p>	<p>Same requirement as iSBEMie Software Tab: “Building Services > HVAC Systems > Bi-valent Systems” section of this document</p>

7.18 iSBEMie Software Tab: “Building Services > SES”.

Data Entry Item	Guidance	Documentary Evidence
In HWS	Select from the HWS that the Solar Hot Water Heating Applies.	In conjunction with the external survey details and photographs, the evidence required is met by one of the following: <ul style="list-style-type: none"> As Built drawings and specifications for New Final or Existing BERs Design drawings and specifications for New Provisional BERs
Area	Enter the aperture area of the solar collectors. The aperture area is the area of the panel that collects solar energy as distinct from the overall plan area of a collector. Refer to Appendix A4.4 of this document for default entries.	The evidence required is met by one of the following: <ul style="list-style-type: none"> Copies of technical data sheets measured in accordance with EN 12975 or data from the HARP database External survey data on survey notes with dimensions and orientation and photographs of solar collectors. As Built drawings and specifications for New Final or Existing BERs Design drawings and specifications for New Provisional BERs;
Orientation	Select from the available options	The evidence required is met by one of the following: <ul style="list-style-type: none"> External survey data with dimensions and orientation and photographs of solar collectors. Use a directional compass. As Built drawings and specifications for New Final or Existing BERs Design drawings and specifications for New Provisional BERs;
Inclination	Select from list of angles between 0° to 90°. 0° tilt represents a horizontal surface. 90° tilt represents a vertical surface. Refer to Appendix A4.4 of this document for default entries.	The evidence required is met by one of the following: <ul style="list-style-type: none"> External survey data on a survey form/report with dimensions and inclination and photographs of solar collectors As Built drawings and specifications for New Final or Existing BERs Design drawings and specifications for New Provisional BERs
Do you know the collector performance parameters from EN 12975-2?	If you know the collector performance parameters according to EN 12975-2 select YES and populate the fields that become active. If it is not possible to obtain the performance parameters for the collector, the default values are used based on the collector selected.	The evidence required is met by one of the following: <ul style="list-style-type: none"> Photographs of solar collectors with nameplate and manufacturer’s data sheets measured to EN 12975-2 by a body with relevant accreditation. As Built drawings and specifications for New Final or Existing BERs Design drawings and specifications for New Provisional BERs;

Data Entry Item	Guidance	Documentary Evidence
Solar Storage	<p>The dedicated solar storage volume associated with the solar panel, insulation type and thickness are entered. Appendix 9 of this document provides guidance on determining the storage volume of storage units when manufacturers data is not available, while Section 3.5.4 of How to use iSBEMie (Volume 2) gives criteria for determining the dedicated solar storage volume for various arrangements.</p>	<p>In conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of HWS Cylinder(s) and nameplates and manufacturer name and manufacturer’s data sheet • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs • Hot water storage volume measured on site (and evidence of any calculations retained by the Assessor)
Do you know the heat transfer rate of the heat exchanger in the collector loop?	<p>Enter “There is no heat exchanger” if the system is a direct system. Enter “No, use the default” if there is a heat exchanger and it is not possible to obtain the performance data for the heat exchanger. Enter “Yes, value is…” if the value is known. Refer to Section 3.5.4 of How to use iSBEMie (Volume 2) for guidance.</p>	<p>In conjunction with the plantroom survey details, the evidence required is met by the following:</p> <ul style="list-style-type: none"> • Photographs of HWS Cylinders and nameplates and manufacturer name and manufacturer’s data sheet • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs;
Do you know the overall heat loss coefficient of all pipes in the collector loop?	<p>Enter “No, use the default” if it is not possible to obtain the performance data for the pipework in the collector loop. Enter “Yes, value is” if the value is known. Refer to Section 3.5.4 of How to use iSBEMie (Volume 2) for guidance.</p>	<p>In conjunction with the plantroom survey details, the evidence required is met by one of the following along with provision of representative photographs of the pipework:</p> <ul style="list-style-type: none"> • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs
Are the distribution pipes between the SES and the back-up system insulated?	<p>This only becomes active if there is a separate solar cylinder to the HWS cylinder.</p>	<p>In conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of pipework • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs

Data Entry Item	Guidance	Documentary Evidence
Auxiliary Energy Consumption	<p>Select from the circulation systems listed in the database and enter the pump power as appropriate.</p> <p>If you cannot determine the type of circulation system, the default entry is "Forced circulation system with no PV".</p>	<p>In conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of pumps and nameplates and manufacturer name and manufacturer's data sheet • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs;

7.19 iSBEMie Software Tab: "Building Services > PVS".

Data Entry Item	Guidance	Documentary Evidence
Type: Enter if peak power is NOT known	<p>Select from the list of PV types.</p> <ul style="list-style-type: none"> • Mono crystalline silicon • Multi crystalline silicon • Multi-layer thin film amorphous silicon • Other thin film layers • Thin film copper-indium-gallium-diselenide • Thin film cadmium-telluride <p>Refer to Appendix A4.5 of this document for default entries.</p>	<p>In conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of PV panels, inverters including nameplates and manufacturer name • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs;
Area Enter if peak power is NOT known	<p>Enter the Area of the PV array.</p> <p>Refer to Appendix A4.5 of this document for default entries of the PV area if unknown.</p>	<p>The evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of Photovoltaics and copies of technical data sheets from manufacturer • Photographs of Photovoltaics and External survey data on a survey form/report with dimensions and orientation • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs
Peak Power	<p>Where there is sufficient data available, the peak power may be entered directly as an alternative to iSBEMie calculating the peak power based on the array type and area.</p>	<p>The evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of panels and copies of technical data sheets from manufacturer in compliance with standard, refer to Section 6.1 of this document • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs

Data Entry Item	Guidance	Documentary Evidence
Orientation	Select from one of the available options.	The evidence required is met by one of the following: <ul style="list-style-type: none"> External survey data on a survey form/report with dimensions and orientation with photographs of PV. Use a directional compass As Built drawings and specifications for New Final or Existing BERs Design drawings and specifications for New Provisional BERs
Inclination	Select from list of angles between 0° to 90°. 0° tilt represents a horizontal surface. 90° tilt represents a vertical surface. If the inclination angle falls between two of the available options in the iSBEMie dropdown, select the nearest value. Refer to Appendix A4.5 of this document for default entries.	The evidence required is met by one of the following: <ul style="list-style-type: none"> External survey data on a survey form/report with dimensions and inclination and photographs of PVs As Built drawings and specifications for New Final or Existing BERs Design drawings and specifications for New Provisional BERs
Overshading	Select from the drop-down list the level of over-shading of the PV array, aided by the definitions in table 10 in Section 3.5.5 of How to use iSBEMie (Volume 2). It should be assessed taking into account the inclination of the panels.	The evidence required is met by one of the following: <ul style="list-style-type: none"> External survey data with dimensions and orientation with photographs of PV. As Built drawings and specifications for New Final or Existing BERs Design drawings and specifications for New Provisional BERs.
Ventilation strategy	Select from the drop-down list the ventilation strategy for the PV array, aided by the definitions in table 11 in Section 3.5.5 of How to use iSBEMie (Volume 2). The default selection is “Unventilated modules”. The level of ventilation will depend on the cell technology in the PV array so guidance should be sought from the manufacturer if not available on the technical data sheets. Refer to Appendix A4.5 of this document for default entries.	The evidence required is met by one of the following: <ul style="list-style-type: none"> External survey data with dimensions and orientation with photographs of PV. As Built drawings and specifications for New Final or Existing BERs Design drawings and specifications for New Provisional BERs.

7.20 iSBEMie Software Tab: “Building Services > Wind Generators”.

Data Entry Item	Guidance	Documentary Evidence
Terrain Type	Select from the list of Terrain types.	In conjunction with the external survey details, the evidence required is met by one of the following: <ul style="list-style-type: none"> Photographs of surrounding sites; Site plan showing surrounding sites.

Data Entry Item	Guidance	Documentary Evidence
Horizontal Axis – Diameter (m)	<p>Enter the Diameter of the Wind Turbine</p> <p>Refer to Appendix A4.6 of this document for default entries.</p>	<p>The evidence required is met by one of the following:</p> <ul style="list-style-type: none"> Copies of technical data sheets from manufacturer External survey data on a survey form/report with dimensions and photographs of wind turbines <p>As Built drawings and specifications for New Final or Existing BERs</p> <ul style="list-style-type: none"> Design drawings and specifications for New Provisional BERs.
Others – Area (m ²) Active only when other than horizontal axis is selected.	<p>Enter the Area Swept by the rotor blades. Refer to Section 3.5.6 of How to use iSBEMie (Volume 2) for details.</p> <p>Refer to Appendix A4.6 of this document for default entries.</p>	<ul style="list-style-type: none"> As described above
Height (m)	<p>Enter the height by the wind turbine. Refer to Section 3.5.6 of How to use iSBEMie (Volume 2) for details.</p> <p>Refer to Appendix A4.6 of this document for default entries.</p>	<ul style="list-style-type: none"> As described above
Power (kW)	<p>Enter the wind turbine rated power in kW.</p> <p>Refer to Appendix A4.6 of this document for default entries.</p>	<ul style="list-style-type: none"> As described above

7.21 iSBEMie Software Tab: “Building Services > CHP generator”.

Data Entry Item	Guidance	Documentary Evidence
Fuel Type	Select from the Fuel Types	<p>In conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> Photographs of CHP nameplates and manufacturer name and manufacturer’s data sheets Copies of technical data sheets from operational and maintenance manuals <p>As Built drawings and specifications for New Final or Existing BERs</p> <ul style="list-style-type: none"> Design drawings and specifications for New Provisional BERs.

Data Entry Item	Guidance	Documentary Evidence
Heat Efficiency	Seasonal thermal efficiency of the CHP generator, defined as the total annual useful heat supplied by the generator divided by the total annual fuel energy input to the generator (using the gross calorific value).	<p>In conjunction with the plantroom survey details, the evidence required is met by the following:</p> <ul style="list-style-type: none"> • Photographs of CHP nameplates and manufacturer name and manufacturer’s data sheets in compliance with the national standards or the CHP EU directive or EN 15316-4-4 • Copies of technical data sheets from the manufacturer in compliance with sources of efficiency as outlined in Section 6.1 of this document • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs.
Electrical Efficiency	Total annual electric power output by the CHP divided by the total annual fuel energy input (using the gross calorific value).	<ul style="list-style-type: none"> • As described above
Building Space Heat Supplied	Ascertain the proportion of space heating supplied to the building by the CHP plant.	<p>For existing buildings, a report from the Building Operator detailing the proportion of space heating supplied to the building by the CHP plant.</p> <p>Where submetering of the heat is unavailable, the report should be based on actual fuel consumption converted into heat consumption based on the actual plant performances for a 12-month period. This method is only acceptable when there is no “heat dump”.</p> <p>For new buildings, a report signed by engineers from the Design Team, detailing the predicted proportion of space heating supplied by the CHP plant.</p>
Building Hot Water Supplied	Ascertain the proportion of hot water heating supplied to the building by the CHP plant.	<p>For existing buildings, a report from the Building Operator detailing the proportion of hot water supplied to the building by the CHP plant.</p> <p>Where submetering of the hot water is unavailable, the report should be based on actual fuel consumption converted into hot water consumption based on the actual plant performances for a 12-month period. This method is only acceptable when there is no “heat dump”.</p> <p>For new buildings, a report signed by engineers from the Design Team, detailing the predicted proportion of hot water supplied by the CHP plant.</p>
CHPQA	Not in use. Leave blank.	Not applicable

Data Entry Item	Guidance	Documentary Evidence
<p>Tick this box for Trigeneration systems</p>	<p>Ascertain if the building has a Trigeneration system.</p>	<p>In conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of CHP nameplates and manufacturer name and photographs of cooling System (absorption chiller and nameplate) • Copies of technical data sheets from operational and maintenance manuals <p>As Built drawings and specifications for New Final or Existing BERs</p> <ul style="list-style-type: none"> • Design drawings and specifications for New Provisional BERs.
<p>Building Cooling Supplied</p>	<p>The Assessor must ascertain the proportion of cooling supplied to the building by the Trigeneration system</p>	<p>For existing buildings, a report from the Building Operator detailing the proportion of cooling supplied to the building by the Trigeneration.</p> <p>Where submetering of the chilled water is unavailable, the report should be based on running time for the plant over a 12-month period and the actual plant performances. For new buildings, a report signed by engineers from the Design Team, detailing the predicted proportion of space cooling supplied by the CHP.</p>
<p>Chiller Efficiency</p>	<p>The seasonal chiller efficiency of the generator, defined as the cooling demand divided by the cooling energy for the generator.</p>	<p>In conjunction with the plantroom survey details, the evidence required is met by the following:</p> <ul style="list-style-type: none"> • Photographs of CHP nameplates and manufacturer name and photographs of cooling System (absorption chiller nameplate) and manufacturer's data sheets • Copies of technical data sheets from operational and maintenance manuals • Sources of efficiency as outlined in Section 6.1 of this document <p>As Built drawings and specifications for New Final or Existing BERs</p> <ul style="list-style-type: none"> • Design drawings and specifications for New Provisional BERs.

7.22 iSBEMie Software Tab: “Building Services > Zones > Solar Collectors”.

Data Entry Item	Guidance	Documentary Evidence
Solar Collector Parameters	<p>Refer to Section 3.5.8 of How to use iSBEMie (Volume 2) for details on data entry or Press F1 (help) while in a relevant data field.</p> <p>Note: The user must define specific wall elements in the Project database first to represent “non-transpired” solar collectors which form part of the building structure. These are found in the Library under “Light steel framing”.</p>	<p>The evidence required is met by one of the following:</p> <ul style="list-style-type: none"> Photographs of solar collectors and copies of technical data sheets from manufacturer Photographs of solar collectors and External survey data on a survey form/report with dimensions and orientation <p>As Built drawings and specifications for New Final or Existing BERs</p> <ul style="list-style-type: none"> Design drawings and specifications for New Provisional BERs.

7.23 iSBEMie Software Tab: “Building Services > Zones > HVAC, HWS & Lighting Systems”.

Data Entry Item	Guidance	Documentary Evidence
Deadleg Length in this zone	<p>Length of draw off pipe to the outlet in the space (only used in zones where the water is drawn off).</p> <p>The deadleg distance is measured from the edge of the zone or from the storage vessel/ circulation in the zone to the outlet point.</p> <p>Where pipework is not visible in the zone and drawings are unavailable, allow for the deadleg running from the edge of the zone or from the storage vessel/ circulation in the zone to the outlet point. Deadleg lengths less than 3m are not assessed by the software and can be omitted.</p>	<p>The evidence required is met by one of the following:</p> <p>As Built mechanical drawings marked up to show zones for New Final or Existing BERs</p> <ul style="list-style-type: none"> Design drawings and specifications for New Provisional BERs. Sketches of zones/ pipework showing dimensions. Photographs of pipework.

7.24 iSBEMie Software Tab: “Building Services > Zones > Ventilation”.

Data Entry Item	Guidance	Documentary Evidence
Zonal Ventilation Type	<p>If not previously included in the HVAC system, the Assessor may select “Natural” or “Mechanical Supply/Extract” to a zone.</p> <p>In situations where the supply and extract elements of a ventilation system are located in different zones, but form one system, enter that both zones have mechanical supply/ extract ventilation. An example might be air supplied to a corridor outside a toilet and then extracted in the toilet. Can also occur in healthcare zones such as operating theatres.</p>	<p>In conjunction with the floor-by-floor sketches, the evidence required is met by one of the following:</p> <p>As Built mechanical drawings marked up to show zones for New Final or Existing BERs</p> <ul style="list-style-type: none"> Design drawings and specifications for New Provisional BERs a survey form/report and photographs.

Data Entry Item	Guidance	Documentary Evidence
<p>Do you know the Supply/ Extract SFP?</p>	<p>The SFP must be calculated in accordance with the procedure set out in IS EN 13779:2007 Annex D and Appendix E of the current edition of TGD L – Buildings Other than Dwellings published on the gov.ie website.</p> <p>Non-default efficiencies may be obtained from the following sources:</p> <ul style="list-style-type: none"> • Performance data on “CE marked” literature is acceptable provided that the literature refers to the relevant test performance standard. • Literature from manufacturer referencing the efficiency and relevant test performance standard. • Accredited Test certificates to the relevant test performance standard. • It is required that the SFP takes account of the whole system and not just the internal fan power. • It is acceptable to use the SFP_E at 100% design air flow rate 	<p>The evidence required is met by the following:</p> <ul style="list-style-type: none"> • Photographs of fan nameplates and manufacturer’s data sheets • Sources of efficiency as outlined in Section 6.1 of this document • Copies of technical data sheets from operational and maintenance manuals <p>As Built drawings and specifications for New Final or Existing BERs</p> <ul style="list-style-type: none"> • Design drawings and specifications for New Provisional BERs <p>Calculations of SFP must be retained in all cases.</p>
<p>Does activity require high pressure drop air treatment?</p> <p>Relevant for Part L assessments only</p>	<p>This option caters for activities that require the use of high pressure drop air treatment, including high pressure drop air treatment (HEPA) filtration. The assessor can choose to “use the default from the activity database” in which case HEPA filtration not present, (only exception is operating theatres where it is assumed present) or assessors can say HEPA filtration is present by selecting “use user value” AND ticking the box.</p> <p>The “Reference Building” will have an additional 1.0W/l/s added to the SFP to account for this.</p>	<p>If the non-default setting is used the Assessor must obtain drawings and specification showing high pressure drop air treatment is present in the relevant zones.</p> <p>This setting will work for HVAC systems that are air based or for zonal ventilation.</p>
<p>Demand Controlled Ventilation</p>	<p>The Assessor may select the type of control for Demand Controlled Ventilation in a zone if it is present.</p> <p>This field is also usable where Natural Ventilation is selected. The assessor may choose to select “Enhanced ventilation”. This refers to a natural ventilation mechanism being controlled by a BMS.</p>	<p>The evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of ventilation system and controls including either photographs of relevant sensors or photograph of BMS showing sensors • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs;

Data Entry Item	Guidance	Documentary Evidence
Ventilation - Heat Recovery	<p>The heat recovery system may be incorporated within the air handling unit(s) or it may be external. The Assessor must establish whether or not heat recovery is fitted and then select the type of heat recovery equipment.</p>	<p>For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of heat recovery unit • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications. <p>For New Provisional BERs, design drawings and specifications.</p>
Tick if variable heat recovery efficiency	<p>Tick box if documentary evidence is available to show that the heat recovery system can be bypassed or switched off in summer.</p>	<p>For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of bypass/ controls • Copies of technical data sheets from operational and maintenance manuals • As Built drawings and specifications. <p>For New Provisional BERs, design drawings and specifications.</p>

Data Entry Item	Guidance	Documentary Evidence
<p>Heat Recovery Seasonal Efficiency</p>	<p>If you know the heat recovery efficiency, it can be introduced manually into the interface.</p> <p>The value is based on the “dry heat recovery efficiency” / “temperature heat recovery efficiency”. Non-default efficiency values must be in compliance with the Commission Regulation (EU) 1253/2014 with regard to Ecodesign requirements for ventilation units.</p> <p>Non-default efficiencies may be obtained from the following sources as per Section 0:</p> <ul style="list-style-type: none"> • Performance data on “CE marked” literature is acceptable provided that the literature refers to the relevant test performance standard. • Literature from manufacturer referencing the efficiency and relevant Ecodesign standard. • Accredited Test certificates to the relevant test performance standard <p>The default value must be used for efficiency if there is no documentary evidence to substantiate non-default entries.</p> <p>A non-default value should be used where possible.</p>	<p>For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by the following:</p> <ul style="list-style-type: none"> • Photographs of heat recovery unit • Copies of technical data sheets from operational and maintenance manuals • Sources of efficiency as outlined in “Guidance” and Section 6.1 • As Built drawings and specifications. <p>For New Provisional BERs, design drawings, specifications and sources of efficiency as outlined in “Guidance” and Section 6.1.</p> <p>Note: Where commissioning results are available, the heat recovery efficiency is based on the flow rate at the highest setting, where the equipment has variable speed settings. Otherwise, the heat recovery efficiency is based on the nominal or 100% flow rate of the equipment.</p>
<p>Tick Box for Night Cooling</p>	<p>The Assessor may select that there is Night Cooling provided in a zone.</p>	<p>For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of controls demonstrating night cooling • Copies of technical data sheets from operational and maintenance manuals <p>For New Provisional BERs, design drawings and specifications which confirm the inclusion of night cooling in the design.</p>

Data Entry Item	Guidance	Documentary Evidence
<p>Max Hours of Night Cooling (NC) per month</p>	<p>Where documentary evidence is available, enter the maximum number of hours per month during which night cooling is operating in the zone.</p>	<p>For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of controls demonstrating night cooling operational hours • Copies of technical data sheets from operational and maintenance manuals demonstrating night cooling operation hours <p>For New Provisional BERs, design specifications calculations and software output reports which confirm the maximum number of night cooling hours per month for the design.</p>
<p>Max flow rate during Night Cooling (NC) hours</p>	<p>Where documentary evidence is available enter the max. flow rate during NC hours - This is the maximum air flow rate in the zone, in l/s.m² of floor area, during the operation of night cooling.</p>	<p>For New Final and Existing BERs, in conjunction with the plantroom survey details, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Copies of technical data sheets from operational and maintenance manuals demonstrating the commissioned night cooling flow rate <p>For New Provisional BERs, design specifications which confirms the maximum design flow rate during night cooling hours.</p>
<p>Specific Fan Power for Night Cooling</p>	<p>The SFP must be calculated in accordance with the procedure set out in IS EN 13779:2007 Annex D and Appendix E of the current edition of TGD L – Buildings Other than Dwellings published on the gov.ie website.</p> <p>Non-default efficiencies may be obtained from the following sources:</p> <ul style="list-style-type: none"> • Performance data on “CE marked” literature is acceptable provided that the literature refers to the relevant test performance standard. • Literature from manufacturer referencing the efficiency and relevant test performance standard. <p>Accredited Test certificates to the relevant test performance standard.</p>	<p>The evidence required is met by the following:</p> <ul style="list-style-type: none"> • Photographs of fan nameplates and manufacturer’s data sheets • Sources of efficiency as outlined in Section 6.1 of this document • Copies of technical data sheets from operational and maintenance manuals <p>As Built drawings and specifications for New Final or Existing BERs</p> <ul style="list-style-type: none"> • Design drawings and specifications for New Provisional BERs <p>Calculations of SFP must be retained in all cases.</p>

Data Entry Item	Guidance	Documentary Evidence
<p>Specific Fan Power for the system terminal Units</p>	<p>This parameter becomes active if the HVAC system type serving the zone is selected to be 'Fan coil systems' or 'Indoor packaged cabinet (VAV). It allows users to enter the SFP for the terminal unit(s) in the zone.</p> <p>Non-default efficiencies may be obtained from the following sources:</p> <ul style="list-style-type: none"> • Performance data on “CE marked” literature is acceptable provided that the literature refers to the relevant test performance standard. 	<p>The evidence required is met by the following:</p> <ul style="list-style-type: none"> • Photographs of fan nameplates and manufacturer’s data sheets • Sources of efficiency as outlined in Section 6.1 of this document • Copies of technical data sheets from operational and maintenance manuals <p>As Built drawings and specifications for New Final or Existing BERs</p> <ul style="list-style-type: none"> • Design drawings and specifications for New Provisional BERs <p>Calculations of SFP must be retained in all cases.</p>

7.25 iSBEMie Software Tab: “Building Services > Zones > Exhaust”.

Data Entry Item	Guidance	Documentary Evidence
<p>Is there local mechanical exhaust in the zone</p>	<p>The Assessor must ascertain if there is mechanical exhaust from a zone</p>	<p>In conjunction with the floor-by-floor sketches, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • As Built mechanical drawings marked up to show zones • A survey form/report and photographs.
<p>Local Mechanical Exhaust</p>	<p>The Assessor must convert the air flow rate from litres/s or m³/hr to the l/s/m² of floor area required by the software.</p> <p><u>Appendix A4.8 of this document shows an example calculation.</u></p> <p>Default values can be obtained from CIBSE Guide F Part A or <u>Appendix A4.8 of this document.</u></p>	<p>In conjunction with the floor-by-floor sketches, the evidence required is met by one of the following:</p> <p>As Built mechanical drawings marked up to show zones for New Final or Existing BERs</p> <ul style="list-style-type: none"> • Design drawings and specifications for New Provisional BERs • Photos of fan nameplates showing Model number and Flow rate • A survey form/report and photographs. <p>For New Provisional BERs, design specifications</p>

Data Entry Item	Guidance	Documentary Evidence
Do you know the Supply/ Extract SFP?	<p>The SFP must be calculated in accordance with the procedure set out in IS EN 13779:2007 Annex D Calculation and Appendix E of the current edition of TGD L – Buildings Other than Dwellings published on the gov.ie website. Non-default efficiencies may be obtained from the following sources:</p> <ul style="list-style-type: none"> • Performance data on “CE marked” literature is acceptable provided that the literature refers to the relevant test performance standard. • Literature from manufacturer referencing the efficiency and relevant test performance standard. • Accredited Test certificates to the relevant test performance standard. 	<p>The evidence required is met by the following:</p> <ul style="list-style-type: none"> • Photographs of fan nameplates and manufacturer’s data sheets • Sources of efficiency as outlined in Section 6.1 of this document • Copies of technical data sheets from operational and maintenance manuals <p>As Built drawings and specifications for New Final or Existing BERs</p> <ul style="list-style-type: none"> • Design drawings and specifications for New Provisional BERs <p>Calculations of SFP must be retained in all cases.</p>
<p>Scope of Extract system</p> <p>(This item changes the allowable Part L compliance SFP value)</p>	<p>Here you can use the radio buttons to specify whether the exhaust fan is:</p> <p>remote from the zone (i.e., the exhaust system serves multiple spaces), with/without grease filter (e.g., for kitchen).</p> <p>or within the zone (i.e., a local window/wall/roof unit such as in a toilet)</p>	<p>The evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • Photographs of the installation • As Built drawings and specifications for New Final or Existing BERs • Design drawings and specifications for New Provisional BERs

7.26 iSBEMie Software Tab: “Building Services > Zones > Lighting”.

Data Entry Item	Guidance	Documentary Evidence
What information is available on Lighting?	<p>The Assessor has a choice on how the lighting is entered. Depending on the amount of information available to the BER assessor, there may be a combination of the three lighting entry options used in an assessment.</p> <p>Select from:</p> <ul style="list-style-type: none"> • Full lighting design carried out. • Lighting chosen but calculation not carried out. • Lighting Parameters not available <p>Note: It is recommended that the actual lighting type be entered in the “Lighting parameters not available” field as it will change recommendations on the Advisory Report. Do not tick the adjacent box if “Full lighting design” or “Lighting chosen but calculation not carried out” are being used.</p>	<p>Refer to the individual sections below.</p> <ul style="list-style-type: none"> • As Built drawings and specifications and lighting calculations for New Final or Existing BERs • Design drawings and specifications and lighting calculations for New Provisional BERs • Photographs of Lighting and Lighting Controls. <p>When the information is insufficient for a “Full lighting design” to be used in a particular zone the lighting is entered using “Lighting chosen but calculation not carried out”.</p> <p>When information is insufficient for “Lighting chosen but calculation not carried out” to be used in a particular zone the lighting must be made using “Lighting Parameters not available”</p>

Data Entry Item	Guidance	Documentary Evidence
<p>Full lighting design carried out</p>	<p>Total wattage: This value should be for the lighting system, i.e., it includes the luminaires and ballasts (control gear).</p> <p>The total wattage should be for the fixed light fittings only. Where task lighting is “plug in” lighting it should not be included in the model.</p> <p>It is recommended that the actual lighting type be entered in the “Lighting Parameters not available” field as it will change recommendations on the Advisory Report.</p>	<p>In order to use the “Full lighting design carried out” entry the Assessor must have a signed statement from a suitably qualified consultant (normally the M&E engineers) responsible for the lighting design showing:</p> <p>In the case of a Provisional BER, the design power and design illuminance for each of the zones.</p> <p>In the case of a New Final and Existing BER,</p> <ul style="list-style-type: none"> • the installed power and installed illuminance for each of the zones. • photographs of lighting and lighting controls. <p>When information is insufficient for a particular zone or zones the lighting in the zone or zones must be entered using “Lighting chosen but calculation not carried out” or “Lighting Parameters not available”, as described below.</p>

Data Entry Item	Guidance	Documentary Evidence
<p>Lighting chosen but calculation not carried out</p>	<p>Both fields require data entry.</p> <p>A luminaire is the light fitting complete with a removable “bulb” or an integrated circuit with set of light emitters. A “bulb” (or equivalent) is called a lamp in SBEM.</p> <p>Lamp lumens per circuit wattage: This is the value in lumens for the lamp / bulb in the fitting.</p> <p>The lamp lumen per circuit wattage should be for the fixed light fittings only. Where task lighting is “plug in” lighting it should not be included in the model.</p> <p>Light output ratio (LOR): This value between 0.1 and 1.0 represents the efficiency of the luminaire / fitting to distribute the light from the lamp / bulb.</p> <p>Note: Most manufacturers only declare a luminaire luminous efficacy, especially for LED fittings. If the value available is the luminous efficacy of the luminaire, rather than that of the lamp, then you can enter the luminaire value into iSBEMie with a LOR of 1.0</p> <p>Note: “Control Factors” should not be included in calculations.</p>	<p>In conjunction with the floor-by-floor sketches, the evidence required is met by Manufacturers Data Sheets plus the following:</p> <ul style="list-style-type: none"> • As Built Electrical Lighting Drawings marked up to show zones for New Final and Existing Buildings • Design Electrical Lighting Drawings and Specification marked up to show zones for New Provisional • Operation and maintenance manuals • Photographs of light fittings. Photograph(s) of each light type should be provided. <p>When information is insufficient for a particular zone the lighting must be entered using the “Lighting Parameters not available” as described below.</p>

Data Entry Item	Guidance	Documentary Evidence
<p>Lighting parameters not available</p>	<p>Determine the lamp type for each zone. Where the specific fitting cannot be identified, take the most conservative (lowest lumens per circuit watt) option from Table 12 in How to use iSBEMie (Volume 2) or Table 7 in the NEAP Modelling Guide.</p> <p>Refer to Appendix 11 of this document for guidance on selection of lamp type.</p> <p>Refer to Appendix 4.7 of this document for details on how Shell and Core buildings are dealt with.</p> <p>In situations where the lighting type is unknown, but you know the luminaire installation date or building build date:</p> <ul style="list-style-type: none"> • 2017 or earlier: Tungsten or halogen • 2018 onwards: T8 Fluorescent – triphosphor – high frequency ballast. 	<p>In conjunction with the floor-by-floor sketches, the evidence required is met by the following:</p> <ul style="list-style-type: none"> • As Built Electrical Lighting Drawings marked up to show zones for New Final and Existing Buildings • Operation and maintenance manuals confirming the lighting type. • A survey form/report • Photographs of light fittings. Photograph(s) of each light type should be provided. • Design Electrical Lighting Drawings and Specification marked up to show zones for New Provisional <p>Note: Part L compliance may not be achievable using this entry method.</p>

Data Entry Item	Guidance	Documentary Evidence
<p>Combination of light fittings in a zone when using “Lighting Parameters not available”</p>	<p>Where a combination of lighting systems is present in the zone providing general lighting (no display lighting), the zone should be split to reflect the lamp locations.</p> <p>Where splitting the zone, to reflect the lamp’s location, is not practicable (for example the zone contains a combination of fluorescents and LED down lighters mixed throughout the zone), then the average performance is determined as follows:</p> <ul style="list-style-type: none"> • The proportion of the zone’s area lit by each lamp type is established. • Calculate average performance based on Table 12 of iSBEM User Guide. For example, assuming 60% of floor area is fluorescents, 22.5 lumen/cW from Table 12 and 40% of floor area is LED, 50 lumen/cW. <p>$0.6 \times 22.5 + 0.4 \times 50 = 33.5$</p> <p>Select equivalent lamp from Table 12 in the iSBEMie User Guide Volume 2, i.e., closest performance below value. In this case T8 Fluorescent – halophosphate – high frequency ballast.</p>	<p>Refer to “Lighting Parameters not available” section above for required evidence</p>
<p>Are air extracting luminaires fitted</p>	<p>The Assessor must determine if air extracting luminaires are fitted.</p>	<p>In conjunction with the floor-by-floor sketches, the evidence required is met by one of the following:</p> <ul style="list-style-type: none"> • As Built Electrical Lighting Drawings marked up to show zones • A survey form/report and photographs of light fittings.

7.27 iSBEMie Software Tab: “Building Services > Zones > Lighting Controls”.

Data Entry Item	Guidance	Documentary Evidence
<p>Lighting Controls</p>	<p>The Assessor must determine the lighting controls within the zone.</p>	<p>In conjunction with the floor-by-floor sketches, the evidence required is met by the following:</p> <ul style="list-style-type: none"> • As Built Electrical Lighting Drawings marked up to show zones for New Final and Existing Buildings • A survey form/report • Photographs of lighting controls. • Design Electrical Lighting Drawings and Specification marked up to show zones for New Provisional

Data Entry Item	Guidance	Documentary Evidence
Local Manual Switching	Determine if occupants can control the luminaries individually and if light switch is within 6m of the luminaries it controls.	In conjunction with the floor-by-floor sketches, the evidence required is met by the following: <ul style="list-style-type: none"> • As Built Electrical Lighting Drawings marked up to show zones for New Final and Existing Buildings • A survey form/report • Photographs of lighting switches. • Design Electrical Lighting Drawings and Specification marked up to show zones for New Provisional
Photoelectric Options	Determine the type of switching, whether a different sensor controls the back of the zone, the type of sensor and the Parasitic Power of the sensor. Refer to Section 3.5.9 of How to use iSBEMie (Volume 2). Establish whether or not the sensor has a photoelectric function, by carrying out on site tests or obtaining technical data sheets detailing the light control functions in each zone.	In conjunction with the floor-by-floor sketches, the evidence required is met by one of the following: <ul style="list-style-type: none"> • As Built electrical lighting drawings and specification marked up to show zones for New Final and Existing Buildings • Photographs of lighting controls • Technical data sheets on the lighting controls from Operational and Maintenance manuals. • Design Electrical Lighting Drawings and Specification marked up to show zones for New Provisional
Constant illuminance control	Applies to dimmable fittings only. The luminaire output is controlled to just provide the required maintained illuminance. These schemes will also benefit from reduced energy use. As the light output decays with time, the controls raise input power to the luminaire to compensate.	In conjunction with the floor-by-floor sketches, the evidence required is met by the following: <ul style="list-style-type: none"> • Technical data sheets on the lighting controls from Operational and Maintenance manuals. • Design Electrical Lighting Drawings and Specification marked up to show zones for New Provisional

Data Entry Item	Guidance	Documentary Evidence
Automatic daylight zoning for lighting controls?	<p>Active if manual or photoelectric controlled lighting is chosen.</p> <p>'Yes', then iSBEMie will automatically sub-divide the zone into daylighting zones following the zoning rules for lighting. Refer to Section 3.3 of iSBEMie User Guide Vol 1: Basics for the zoning rules.</p> <p>'No', where the assessor zones the lighting manually.</p> <p>Manual zoning is required when there are differing wall heights/areas in the room which will upset the 6m from 20% glazing area rule.</p> <p>Manual zoning is also required where sloped ceilings, a sloped floor, or a room in roof are present since the rule of 1.5 room heights beyond rooflights if applied automatically may be inaccurate.</p>	<p>In conjunction with the floor-by-floor sketches, the evidence required is met by the following:</p> <ul style="list-style-type: none"> • Technical data sheets on the lighting controls from Operational and Maintenance manuals. • Design Electrical Lighting Drawings and Specification marked up to show zones for New Provisional
Photoelectric Options – Parasitic Power	<p>The parasitic power or the standby power is the power required to operate the lighting controls and detectors.</p>	<p>In conjunction with the floor-by-floor sketches, the evidence required is met by the following:</p> <ul style="list-style-type: none"> • Technical data sheets on the lighting controls from Operational and Maintenance manuals. • Design Electrical Lighting Drawings and Specification marked up to show zones for New Provisional
Occupancy Sensing	<p>Determine the type of Occupancy Sensing Controls and the Parasitic Power of the sensor.</p> <p>Refer to Section 3.5.9 of How to use iSBEMie (Volume 2).</p>	<p>In conjunction with the floor-by-floor sketches, the evidence required is met by the following:</p> <ul style="list-style-type: none"> • As Built electrical lighting drawings and specification marked up to show zones for New Final and Existing Buildings • Design Electrical Lighting Drawings and Specification marked up to show zones for New Provisional <p>For Existing Buildings, if As Built electrical lighting drawings and specification are not available:</p> <ul style="list-style-type: none"> • Survey notes and photographs of lighting controls, and • Technical data sheets on the lighting controls from Operational and Maintenance manuals.

Data Entry Item	Guidance	Documentary Evidence
Occupancy Sensing – Parasitic Power	The parasitic power or the standby power is the power required to operate the lighting controls and detectors.	In conjunction with the floor-by-floor sketches, the evidence required is met by: <ul style="list-style-type: none"> • Technical data sheets on the lighting controls from Operational and Maintenance manuals. • Design Electrical Lighting Drawings and Specification marked up to show zones for New Provisional

7.28 iSBEMie Software Tab: “Building Services > Zones > Display Lighting”.

Data Entry Item	Guidance	Documentary Evidence
Does the display lighting use efficient lamps? Is there time switching?	<p>This section becomes active when iSBEMie assumes the presence of display lighting.</p> <p>Refer to Appendix 4.9 of this document for a list of zones where display lighting is applied by SBEM.</p> <p>The default power density used can be high and so it is important to input a value for the lamp luminous efficacy when possible.</p> <p>Refer to Appendix 4.9 of this document for guidance on reducing the power allocated in the cases where the display lighting is “low energy” or where none is actually present.</p>	In conjunction with the floor-by-floor sketches, the evidence required is met by one of the following: <ul style="list-style-type: none"> • As Built electrical lighting drawings and specification marked up to show zones • A survey form/report and photographs of lighting controls • Technical data sheets on the lighting controls from the operational and maintenance manuals. • Design Electrical Lighting Drawings and Specification marked up to show zones for New Provisional

Appendix 1: The NEAP survey form

Electronic copies in MS Excel and pdf of the NEAP survey form can be found on the [SEAI Website](#). These forms are intended to assist BER Assessors with data gathering. BER Assessors are not obliged to use the SEAI-versions, they may use versions they developed themselves, if they contain all relevant information. It is recommended that BER Assessors keep survey notes by using either the SEAI-version or their own versions to ensure clarity in case of audit and to help prevent omissions and errors.

The first page of the SEAI NEAP survey form/report is reproduced below for information.

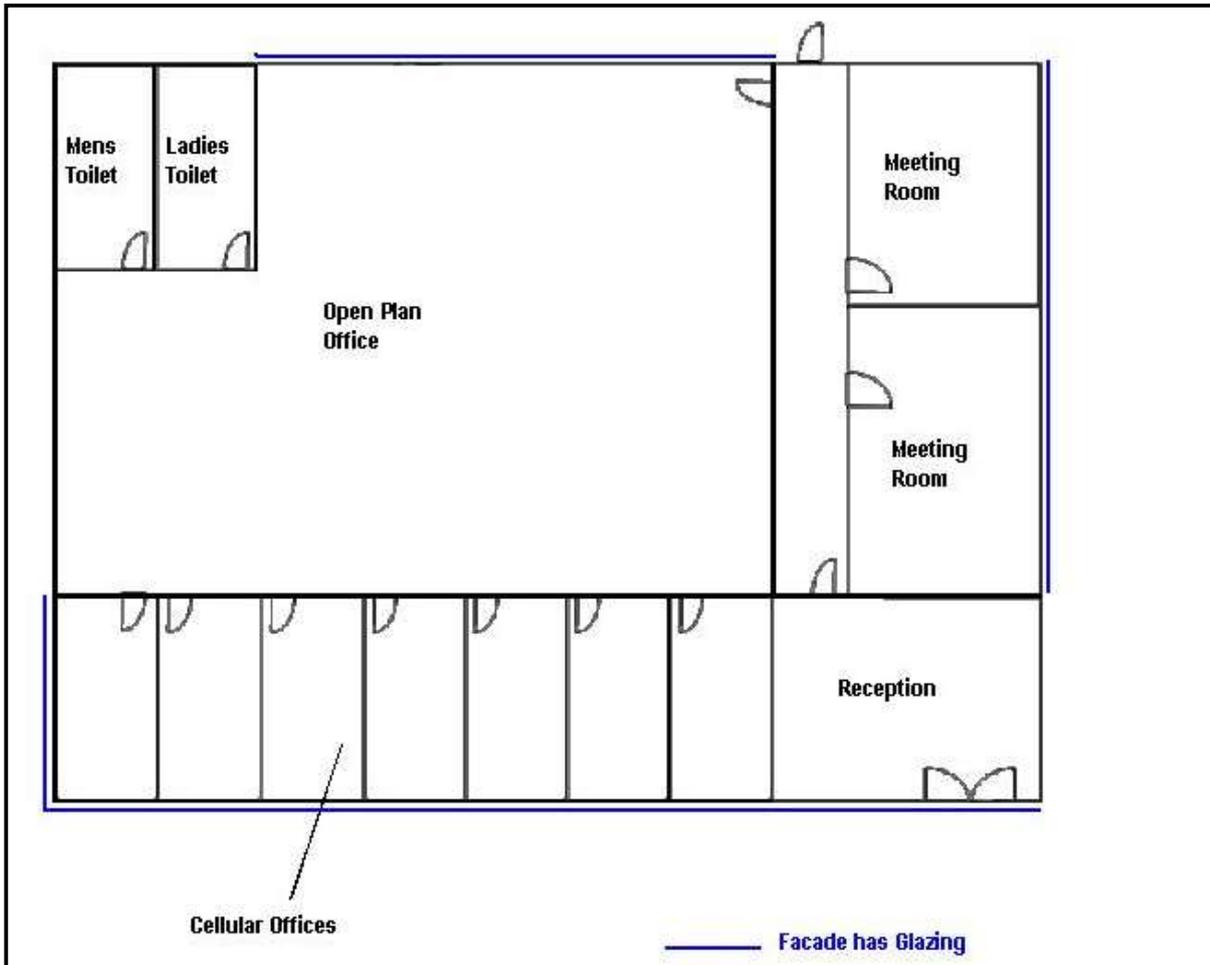
NEAP SURVEY FORM			
Name: _____		Assessor / BER reg. no. _____	
Address: _____		Survey Date: _____	
Eircode _____		MPRN _____	
Building Type _____			
Age: Building <input type="checkbox"/> Evidence 1 <input type="checkbox"/> Evidence 2	Age: Extension 1 <input type="checkbox"/> No Extension <input type="checkbox"/> Evidence 1 <input type="checkbox"/> Evidence 2	Age: Extension 2 <input type="checkbox"/> No Extension <input type="checkbox"/> Evidence 1 <input type="checkbox"/> Evidence 2	number of storeys <input type="text"/>
Air Test ? <input type="checkbox"/> Default 25 <input type="checkbox"/> Cert available	Thermal Bridging ? <input type="checkbox"/> Default <input type="checkbox"/> Data available	Building Type(s) _____	Type of Rating <input type="checkbox"/> new-provisional <input type="checkbox"/> new-final building <input type="checkbox"/> existing building
Wall construction Main Wall Type 1*	Roof Construction: Main Roof*	Ground Floor Construction: Main Floor*	
_____	_____	_____	
Wall construction Wall Type 2*	Roof Construction: Roof Type 2*	Ground Floor Construction: Floor Type 2*	
_____	_____	_____	
Wall construction Wall Type 3*	Roof Construction: Roof Type 3*	Internal Floor Construction: Floor Type 3*	
_____	_____	_____	
Wall construction Wall Type 4*	Construction: Type *	Construction: Type *	
_____	_____	_____	
Window Construction: Wall windows 1 Non-Default Data? N <input type="checkbox"/> Y <input type="checkbox"/> Material Alu <input type="checkbox"/> PVC <input type="checkbox"/> W <input type="checkbox"/> Thermal break N <input type="checkbox"/> Y <input type="checkbox"/> Low E N <input type="checkbox"/> Y <input type="checkbox"/> Argon Gas N <input type="checkbox"/> Y <input type="checkbox"/> Glazing make-up : _____	Window Construction: Roof windows 1 Non-Default Data? N <input type="checkbox"/> Y <input type="checkbox"/> Material Alu <input type="checkbox"/> PVC <input type="checkbox"/> W <input type="checkbox"/> None <input type="checkbox"/> Thermal break N <input type="checkbox"/> Y <input type="checkbox"/> Low E N <input type="checkbox"/> Y <input type="checkbox"/> Argon Gas N <input type="checkbox"/> Y <input type="checkbox"/> Glazing make-up : _____	Door Construction: Personnel door(s)* Door make-up Type 1: _____ Door make-up Type 2: _____	
Window Construction: Wall windows 2 Non-Default Data? N Y Material Alu PVC W Thermal break N <input type="checkbox"/> Y <input type="checkbox"/> Low E N <input type="checkbox"/> Y <input type="checkbox"/> Gas Air / Other A <input type="checkbox"/> O <input type="checkbox"/> Glazing make-up : _____	Window Construction: Wall windows 2 Non-Default Data? N Y Material Alu PVC W Thermal break N <input type="checkbox"/> Y <input type="checkbox"/> Low E N <input type="checkbox"/> Y <input type="checkbox"/> Gas Air / Other A <input type="checkbox"/> O <input type="checkbox"/> Glazing make-up : _____	Door Construction: Vehicle Access door(s) Door make-up Type 1: _____ Door make-up Type 2: _____	

*note: Actual U-value should be calculated and used if the wall /roof /floor construction detail is available on site or through documentation.

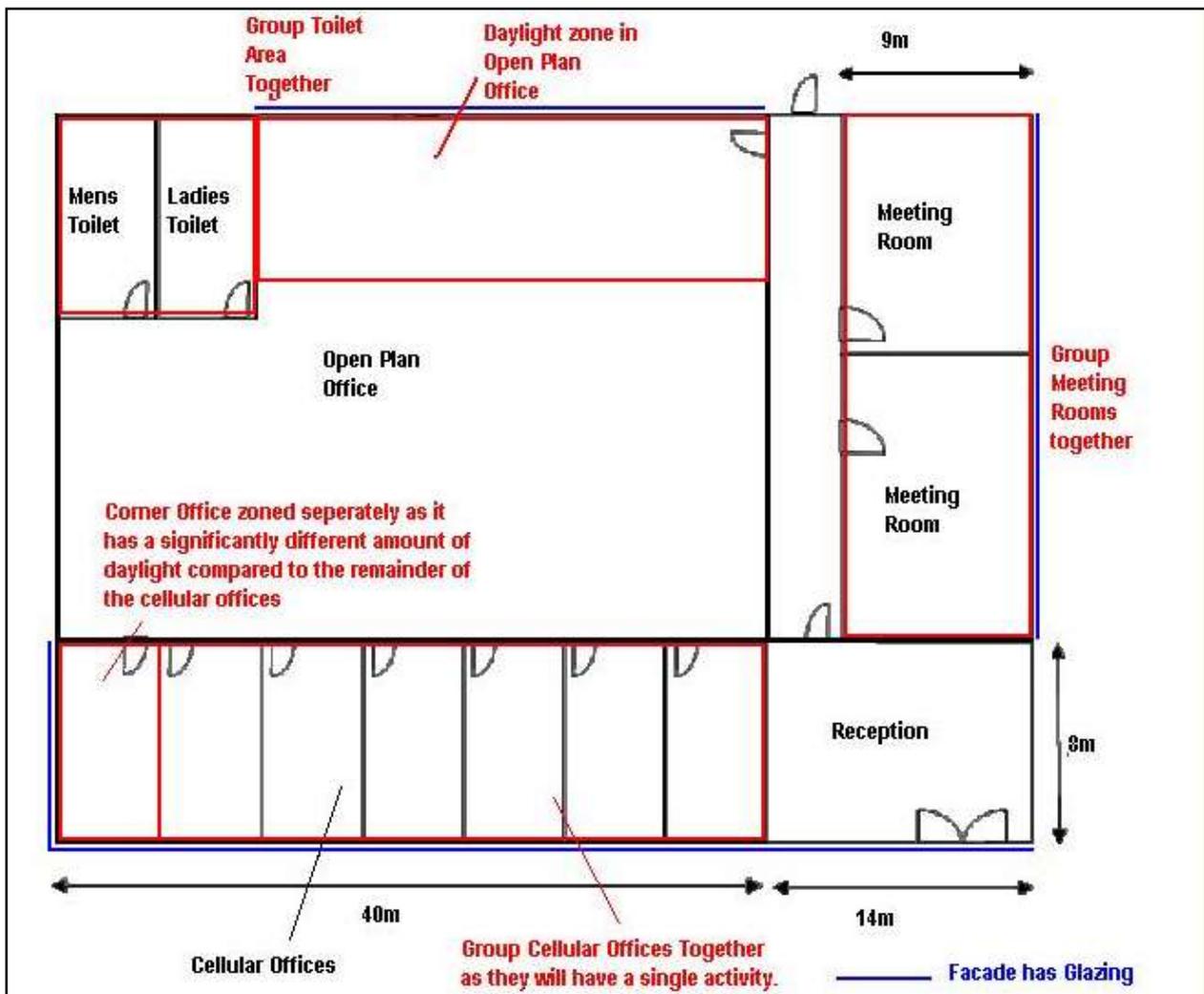
Appendix 2: Zoning Examples

A2.1 Zoning example

Assessors must adhere to the zoning convention as set out in Section 3.3 in How to use iSBEMie (Volume 1) which may help reduce the amount of time and measurement required. The following is an example office building:



Zoning the building by using the convention set out in How to use iSBEMie (Volume 1) can help reduce the number of measurements that need to be taken. The office building can be zoned as follows:



It is important to note that internal envelopes between merged zones with thermal mass must be included within the model. The **km** values determine how the building retains and emits heat, and hence they must be defined in iSBEMie. You can sum the areas of two or more internal walls (between merged zones) with the same construction, adjoining condition and orientation and enter them as one envelope (assigned to the zone resulting from the merging).

If the internal walls are partitions of light construction and have a very small thermal mass, then they should not cause any significant effects on the calculation.

A2.2 Cold Stores

The process load of walk-in fridges or freezers should not be included in the NEAP assessment. The zone types in the previous version of the software, cold or chilled stores, are no longer included as an activity types in iSBEMie.

To enter a cold or a chilled store, select activity type "Warehouse storage" or "24x7 Warehouse storage" under the building type "Storage or Distribution".

The "refrigeration aspect" for this space is a process load since it is designed/provided for the goods and not for the thermal comfort of the occupants in the space and is, therefore, outside the scope of the energy uses which can be accessed via iSBEMie. As such, this zone should be defined as a "Zone without HVAC system" in the iSBEMie model.

Furthermore, for conditioned spaces which surround this zone, the envelopes which are adjacent to this zone should be defined as adjacent to a "Conditioned adjoining space" so that no heat loss is calculated by the software from the surrounding zones through them since the envelopes of walk-in fridges are usually very well-insulated.

Note spaces which accommodate a considerable number of fridges/ freezers, such as in a supermarket or food hall are modelled in iSBEMie using activities such as “Small Shop Unit Sales area - chilled”, “Dept Store Sales area - chilled”, or “Retail Warehouse Sales area - chilled” under the building type “Retail and Financial/Professional services”.

Appendix 3: List of Activities

A list of available zone types / activities available for each building type can be found in Appendix A of [iSBEMie User Guide Vol 1: Basics](#).

This list can assist an assessor in selecting the building type, where it is not immediately apparent, by allowing the assessor to see what zones are available for the building type. It can also assist an assessor to locate a desired zone activity without having to search within the software.

Activity Type / Building Type	Retail and Financial/Professional services	Restaurant and Cafes/Drinking Establishments and Hot Food takeaways	Offices and Workshop businesses	General Industrial and Special Industrial Groups	Storage or Distribution	Hotels	Residential Institutions - Hospitals and Care Homes	Residential Institutions - Residential primary schools	Residential Institutions - Universities and colleges	Secure Residential Institutions	Residential spaces	Non-residential Institutions - Community/Day Centre	Non-residential Institutions - Libraries Museums and Galleries	Non-residential Institutions – Primary Education	Non-residential Institutions - Primary Health Care Building	Non-residential Institutions - Law Courts	General Assembly and Leisure plus Night Clubs and Theatres	Others - Passenger terminals	Others - Emergency services	Others - Miscellaneous 24hr activities	Others - Car Parks 24 hrs	Others - Stand alone utility block	Non-residential Institutions – Post-primary Education	Residential Institutions - Residential Post-primary schools
12hr Specialist Treatment Area							X																	
24 hrs Consulting/treatment areas							X																	
24x7 Bedroom Unit							X																	
24x7 Circulation area (corridors and stairways)																				X				
24x7 Generic					√															√				

Snip of the zone types / activities found in Appendix A of [iSBEMie User Guide Vol 1: Basics](#)

Where multiple building types are used to allow a selection of specific zones to describe a building, the “building type” entered in the general tab of the software is based on the building type from which the largest area of zones has been chosen.

Refer also to Section 3.3 of the iSBEMie Technical Manual, where descriptions of all the building types and all the zone types are listed. Snips of the tables are shown below.

Building Type	Description
General Assembly and Leisure plus Night Clubs and Theatres	Cinemas, music and concert halls, bingo and dance halls, swimming baths, skating rinks, gymnasiums or sports arenas (except for motor sports or where firearms are used). This type also includes night clubs and theatres.
General Industrial and Special Industrial Groups	Used for the carrying on of an industrial process other than one falling within TCP Use class B1 and including those within TCP Use classes B3 to B7.
Hotels	Hotels, boarding and guest houses where no significant element of care is provided.
Non-residential Institutions - Community/Day Centre	Crèches, day nurseries and day centres.

Snip of the list of building types, found in Section 3.3 of the iSBEMie Technical Manual

Activity Type	Description
12hr Specialist Treatment Area	Treatment rooms that will predominantly be used during the day. Examples include: Day Case Theatre, Minor Procedure/Surgery Room, Local Anaesthetic.
24 hrs Consulting/treatment areas	For all A&E consulting/treatment/work areas, occupied and conditioned 24 hours a day.
24x7 Bedroom Unit	En suite bedrooms for patients with 24 hrs occupancy.
24x7 Circulation area (corridors and stairways)	For all 24x7 hrs circulation areas such as corridors and stairways.
24x7 Generic Office Area	Areas to perform 24 x7 hrs office work including offices and meeting rooms. It can include internal corridors providing access to the office

Snip of the activity description table found in Section 3.3 of the iSBEMie Technical Manual

Appendix 4: Default Data

This section outlines defaults to be used for non-domestic BERs in the absence of evidence supporting non-default data. Actual data must be used where acceptable evidence is available.

A4.1 Project Database

The Age of Building/ Year of Construction is used to identify the appropriate default U-values for construction elements based on the relevant building regulations.

Note on use of defaults:

- Buildings constructed **prior** to the introduction of Building Regulations in 1991 were not required to have insulation; therefore, the Assessor must demonstrate that insulation is present when selecting “1974 – 1990” options for external elements. “1974 - 1990” assumes a certain amount of insulation is present. If unable to demonstrate that insulation is present in “1974 – 1990” buildings, “No date – Uninsulated” must be used for external elements from “Help with Inference procedures”.
- Buildings constructed **after** the introduction of Building Regulations in 1991 were required to have insulation, therefore select relevant building regulations for external elements except where the element is known to be uninsulated. In this case, select “No date – Uninsulated” from “Help with Inference procedures”.
- For internal elements (walls, floors, or ceilings), irrespective of the adjoining condition, select “No date – Uninsulated” irrespective of the age of the building, unless able to demonstrate that insulation is present. In this case, calculate the U-value by adding the insulation resistance to the default U value for the element without insulation.
- For glazing, the survey process provides information on window area, glazing type, age, frame type and orientation. Select from “Import one from the library” within iSBEMie software. For the Glazing type assume:
 - If unable to determine whether double glazing is Low “E” or not, assume that double glazing installed before 2004 is not Low “E” and during or after 2004 is Low “E”.

- Assume that double or triple glazing is air-filled unless documentary evidence is provided to substantiate an alternate.
- The gap between double and triple glazing panes must be assumed as 6mm unless measured as otherwise (accounting for pane thickness of 4mm where necessary).
- Select a pre-1991 frame where the glazing date is unknown.

In all cases, the non-default U-values can be calculated using full details where available. For example, for opaque elements thicknesses and thermal properties are known for all the layers and for glazed elements manufacturers declaration forms are available in compliance with relevant standards.

iSBEMie Software Tab: "Project Database"

Year of Construction Relevant Building Regulations and selecting defaults.

Pre 1994 (external elements)	Opaque Element "No date – Uninsulated" – is selected unless the element is proven to be insulated. 1974 - 1990 – where element is proven to be insulated. Glazing: Glazing – As per Note 4 Frame Age – "Pre 1991"
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1994 to 1999 (external elements)	Opaque Element: 1991 Building Regulations or, "No date – Uninsulated" – where element is known to be uninsulated. Glazing: Glazing – As per Note 4 Frame Age - 1991 & 1997 Part L
-------------------------------------	--

2000 to 2007 (external elements)	Opaque Element: 1997 Building Regulations or, "No date – Uninsulated" – where element is known to be uninsulated. Glazing: Glazing – As per Note 4 Frame Age - 1991 & 1997 Part L
-------------------------------------	--

2008 to 2009 (external elements)	Opaque Element: 2006 Building Regulations or, "No date – Uninsulated" – where element is known to be uninsulated. Glazing: Glazing – As per Note 4 Frame Age - 2006 & 2008 Part L
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Post 2010 to 2018 (external elements)	Opaque Element: 2008 Building Regulations or, "No date – Uninsulated" – where element is known to be uninsulated. Glazing: Glazing – As per Note 4 Frame Age - 2006 & 2008 Part L
--	--

Post 2019 (external elements)	Opaque Element: 2017 Building Regulations or, "No date – Uninsulated" – where element is known to be uninsulated. Glazing: Glazing – As per Note 4 Frame Age - 2017 Part L
----------------------------------	---

Internal Elements Opaque Element:
 “No date – Uninsulated” – unless proven to be insulated.
 Glazing:
 Not included in Assessment

The following examples demonstrate use of the methodology in determining the construction type for various elements:

Example A4.1-1: Roof

The building was constructed in 1975 with a precast concrete flat roof. Following the guidance above the assessor uses the “Help with Inference procedures” to select the following roof:

U-value	<input type="text" value="2.3"/>	W/m2K	Sector	<input type="text" value="Office"/>
K_m	<input type="text" value="12"/>	kJ/m2K	Building Reg Comp.	<input type="text" value="no date, uninsulated"/>
<small>Note that this value was called C_m in previous versions</small>			General Description	<input type="text" value="Flat roofs Asphalt (or chippings on asphalt)"/>

“No date, uninsulated” is selected because the building was constructed prior to 1994 and there is no evidence of insulation.

Example A4.1-2: External Wall

The building was constructed in 2002 with a cavity wall system. Following the guidance above the assessor uses the “Help with Inference procedures” to select the following external wall:

U-value	<input type="text" value="0.55"/>	W/m2K	Sector	<input type="text" value="Office"/>
K_m	<input type="text" value="129"/>	kJ/m2K	Building Reg Comp.	<input type="text" value="1997 Regulations (Ireland)"/>
<small>Note that this value was called C_m in previous versions</small>			General Description	<input type="text" value="Cavity wall, bricks/blocks"/>

“1997 Regulations (Ireland)” is the relevant building regulation as per the above table. This is selected because the building was constructed post the introduction of building regulations and is therefore assumed to have insulation.

Example A4.1-3: Solid Brick Internal Wall

The building was constructed in 2010. The internal walls were constructed of 215mm solid bricks. Following the guidance above the assessor uses the “Help with Inference procedures” to select the following wall:

U-value	<input type="text" value="2.2"/>	W/m2K	Sector	<input type="text" value="Office"/>
K_m	<input type="text" value="180"/>	kJ/m2K	Building Reg Comp.	<input type="text" value="no date, uninsulated"/>
<small>Note that this value was called C_m in previous versions</small>			General Description	<input type="text" value="Solid brick or block wall on in-situ concrete"/>

“No date, uninsulated” is selected as the wall is an internal element. It is assumed that no insulation is present unless the Assessor can demonstrate otherwise.

Example A4.1-4: Internal Stud Partition

The building was constructed in 2005. The internal walls were constructed of a stud partition. Following the guidance above the assessor uses the “Help with Inference procedures” to select the following wall:

U-value	<input type="text" value="1.74"/>	W/m ² K	Sector	<input type="text" value="Office"/>
K _m	<input type="text" value="11.7"/>	kJ/m ² K	Building Reg Comp.	<input type="text" value="no date, uninsulated"/>
<p>Note that this value was called Cm in previous versions</p>			General Description	<input type="text" value="Partition Wall"/>

Note: The default U value for lightweight partition walls in iSBEMie is based on the stud partition wall being uninsulated, where the assessor can demonstrate that insulation is present “no date, insulated” should be selected.

Example A4.1-5: Vehicle Access Door

The building was constructed in 2005. Following the guidance above the assessor uses the “Help with Inference procedures” to select the following door:

U-value	<input type="text" value="3.3"/>	W/m ² K	Sector	<input type="text" value="Office"/>
K _m	<input type="text" value="4.93"/>	kJ/m ² K	Building Reg Comp.	<input type="text" value="1997 Regulations (Ireland)"/>
<p>Note that this value was called Cm in previous versions</p>			General Description	<input type="text" value="Vehicle access door"/>

“1997 Regulations (Ireland)” is the relevant building regulation as per the above table. This is selected because the building was constructed post the introduction of building regulations and is therefore assumed to have insulation.

Example A4.1-6: Floor contact with the underground(earth), own values

The building is new and there are as-built drawings and data on the ground floor build up. A U value calculator has been used to calculate the floor U value.

Name

Generally used in floors that connect the zone to:

Introduce my own values

U-value W/m²K

K_m kJ/m²K

Tick if the U-value is corrected

The U value calculator can calculate the floor to ground contact to the standard “ISO 13370:2007 - Thermal Performance of Buildings - Heat Transfer via the Ground”.

Ground floor contact acts as an insulator and the improvement in a U value is dependent on both the amount of insulation and the ratio of exposed perimeter to floor area.

Note the tick box has been selected by the Assessor to indicate the ground contact has been **accounted for already** in the 0.12W/m²K figure. If this box is left unticked iSBEM will make the correction again. This will mean the correction will happen twice which will result in too small a U value being used in the calculation.

Note: If it happened that the Assessor had data on the build-up but was not in a position to calculate the correction externally before entry into iSBEMie the Assessor will leave the box unticked. The user input **un-corrected** U-value for the ground floor should be the inverse of the resistance of the floor construction only (R_f in equation 3.20 of “CIBSE Guide - Vol. A - 2007”), i.e., before allowing for any ground effect (perimeter to area) or edge insulation.

Note: The box is initially unticked; so, where an Assessor is entering their own values for Ground Floors in contact with underground, the assessor may need to tick the box. Check the U value calculation to check if it is corrected.

Note: The correction to U values can be calculated using a hand calculation. Details on such a calculation can be found in Appendix A of TGD L.

Note: Where an Assessor uses the library or inference method iSBEMie will make the correction automatically and the Assessor does not need to take any further action to account for the ratio of exposed perimeter to floor area

Example A4.1-7: Floor over carpark, own values

The building is new. There is an underground carpark that is strongly ventilated under the office floor. The office floor is insulated and there are as-built drawings and data on the floor build up. An approved U value calculator has been used to calculate the floor U value.

Since There is no direct contact with earth, the tick box has NOT been selected by the Assessor.

When entering own values for suspended floors the U value entered by the Assessor must include the internal and external surface resistances in its figure, much like an own value for a wall U value.

Ticking the box in this instance would make no difference since iSBEMie will only apply a correction when the contact is to underground.

Example A4.1-8: Window non-default entries

In this example, the Assessor has already identified the window make and model from an invoice for window supply and installation showing the exact address of the building.

The Assessor contacts the supplier requesting accredited test certs or CE marked data.

The supplier reverts with CE marked document referencing:

- Same make and model as identified by the Assessor.
- The building address.
- $U_w = 0.82W/m^2K$
- Solar transmittance, $g_{\perp} = 0.6$ (called T-Solar in iSBEM)
- Light transmittance = 0.68 (called L-Solar in iSBEM)
- The above have been calculated using approved software validated by an accredited body.

Parameters are entered in iSBEMie project database as shown.

Example A4.1-9: Window default entries

- The building was constructed in the 1970's with windows installed more recently
- There is no information available to confirm the date of window retrofit
- The windows are double glazed with aluminium frame
- The windows appear to have coating when viewed from the side

Default values must be assumed due to lack of evidence:

- Assumed to be uncoated as there is no evidence show they are 2004 or later
- Assumed air-filled as no evidence of another gas filling available
- Unless measured, the type is 4-6-4
- Earliest age band is selected for this window frame. Select pre-1991, ensure frame material is correct.

Glazings from the Library									
Glazing library	4-6-4, uncoated glass, air filled								
Frame library	Metal Frame, pre-1991								
B Reg Comp	<table border="1"> <tr> <td>Metal Frame, 2017 Part L</td> <td>Metal window frame</td> </tr> <tr> <td>Metal Frame, 2006 & 2008 Part L</td> <td>Metal window frame</td> </tr> <tr> <td>Metal Frame, 1991 & 1997 Part L</td> <td>Metal window frame</td> </tr> <tr> <td>Metal Frame, pre-1991</td> <td>Metal window frame</td> </tr> </table>	Metal Frame, 2017 Part L	Metal window frame	Metal Frame, 2006 & 2008 Part L	Metal window frame	Metal Frame, 1991 & 1997 Part L	Metal window frame	Metal Frame, pre-1991	Metal window frame
Metal Frame, 2017 Part L	Metal window frame								
Metal Frame, 2006 & 2008 Part L	Metal window frame								
Metal Frame, 1991 & 1997 Part L	Metal window frame								
Metal Frame, pre-1991	Metal window frame								
Nº names									

A4.2 HVAC System Defaults

In some zones, a default HVAC system must be specified. Further Guidance is given in Appendix 7 through the use of flow charts in helping identify the use of default HVAC systems.

Default HVAC systems are applied to zones meeting the following criteria:

- There is no fixed heating installed;
- There are floor and ceiling finishes, lighting, and ventilation as appropriate;
- The Activity Type requires conditioning;
- There is no proposed design available specifying a HVAC system.
- Not considered transient or indirectly conditioned spaces.

When assuming a default HVAC system following the guidance above and the guidance in Appendix 7 of this document, then use the following table:

iSBEMie Software Tab: "HVAC"

Data Entry Item	Default HVAC Systems
No evidence of a HVAC present in a zone.	The default HVAC systems for buildings are as follows:
Consult Appendix 7 of this document to determine when a default system is required.	<ol style="list-style-type: none"> 1. 'Heating only - Electric resistance' - Assumed to be an electric central heating system with warm air distribution. If you do not know the heating method, you should select electric resistance heating as your default. Selected when no non-electrical fuels are present. 2. "Heating only - Other systems' - Assumed to be wet radiator system, heat generated by fuel combustion. This is applied where the building also has a fuel source other than electricity installed. 3. 'Heating and mechanical cooling' - Assumed to be constant volume air system with terminal reheat and fixed fresh air. This is the assumed HVAC system in the absence of other information for conditioned spaces. 4. If Appendix 7 guidance allows no HVAC system to serve a zone (i.e., an unconditioned zone in iSBEMie) select "Zone without HVAC system". This is only in the case where it has been justified that a HVAC system is not required in the zone in the NEAP assessment.
	For details Refer to Section 3.4.3 of How to use iSBEMie (Volume 2)

The following table outlines when various default HVAC systems apply following the guidance above:

Default HVAC System	Building Condition	Zone Conditions
Heating only - Electric resistance	<p>No alternate (e.g., gas/oil) fuel present in the building.</p> <p>Electricity may or may not be connected to the building.</p>	<p>Zone Activity requires heating (as highlighted by the red exclamation mark in iSBEMie), for example: Offices, Meeting Rooms, Laboratory, Consulting Room, Sales Area, Performance Area, Classroom</p> <p>Does not include unheated transient or indirectly conditioned spaces or spaces heated by a process load.</p> <p>While the zone activity requires heating, the zone is also capable of being naturally ventilated and therefore there is no requirement for cooling. The zone also lends itself to meeting CIBSE Guide A and the Building Regulations for naturally ventilated spaces. The CIBSE Guide A Section 1.4.2.5 and the Building Regulations require this in the absence of mechanical cooling or mechanical ventilation. The zone would be expected to achieve adequate natural ventilation following Building Regulation/ CIBSE requirements under the following circumstances:</p> <ul style="list-style-type: none"> • Internal load is not excessive, and • Space can be naturally ventilated³ for example: <ul style="list-style-type: none"> • Zones not deeper than 7m for single side ventilation and 14m for cross ventilation • Sufficient natural ventilation openings e.g., openable windows, doors (approximately 5% of floor area)
Heating only - Other systems	<p>Alternate fuel present in the building, for example:</p> <ul style="list-style-type: none"> • Natural Gas pipework connected to building, whether meter evident or not. • Oil Tank Present and connected to building. • LPG Tank Present and connected to building. • Solid Fuel Store Present. 	<p>Zone Activity requires heating (as highlighted by the red exclamation mark in iSBEMie), for example: Offices, Meeting Rooms, Laboratory, Consulting Room, Sales Area, Performance Area, Classroom</p> <p>Does not include unheated transient or indirectly conditioned spaces or spaces heated by a process load.</p> <p>While the zone activity requires heating, the zone is also capable of being naturally ventilated and therefore there is no requirement for cooling. The zone also lends itself to meeting CIBSE Guide A and the Building Regulations for naturally ventilated spaces. The CIBSE Guide A Section 1.4.2.5 and Building Regulations require this in the absence of mechanical cooling or mechanical ventilation. The zone would be expected to achieve adequate natural ventilation following the Building Regulation/ CIBSE requirements under the following circumstances:</p> <ul style="list-style-type: none"> • Internal load is not excessive, and • Space can be naturally ventilated⁴ for example: <ul style="list-style-type: none"> • Zones not deeper than 7m for single side ventilation and 14m for cross ventilation • Sufficient natural ventilation openings e.g., openable windows, doors (approximately 5% of floor area)

³ The choice of default HVAC system should be in line with the guidance in TGD F Ventilation where applicable.

⁴ The choice of default HVAC system should be in line with the guidance in TGD F Ventilation where applicable.

Default HVAC System	Building Condition	Zone Conditions
<p>Heating and mechanical cooling</p>	<p>Alternate fuel present in the building and where cooling is required, for example:</p> <ul style="list-style-type: none"> Natural Gas pipework connected to building, whether meter evident or not. Oil Tank Present and connected to building. LPG Tank Present and connected to building. Solid Fuel Store Present <p>Where no alternate fuel is present in the building, but it is proven that cooling is required, "Natural Gas" is selected as the heating fuel. Currently electricity is not available as a heating fuel for the default system, "Natural Gas" is selected as it is the heating fuel used in the notional building. Grid supplied electricity is selected for cooling.</p>	<p>Zone Activity requires heating (as highlighted by the red exclamation mark in iSBEMie), for example: Offices, Meeting Rooms, Laboratory, Consulting Room, Sales Area, Performance Area, Classroom</p> <p>Does not include unheated transient or indirectly conditioned spaces or spaces heated by a process load.</p> <p>Zone also requires cooling, and it is not possible to naturally ventilate, for example: Offices, Meeting Rooms, Laboratory, Consulting Room, Sales Area, Performance Area, Classroom</p> <p>Does not include unheated transient, indirectly heated spaces or spaces heated by a process load.</p>

Transient zones

Some unheated zones have a transient/ passing occupancy such as toilets. For transient zones, where "Zones without HVAC system" is applicable, it is acceptable for the red exclamation mark"!" to be ignored by the assessor. There are further details on transient spaces refer to Appendix 7 and 8 of this survey guide.

Indirectly conditioned zones

Zones which are not serviced by a HVAC system, i.e. have no direct supply of heating or cooling, but are likely to be indirectly conditioned by the surrounding areas due to the high level of interaction with those spaces (allowing the heated air to move freely from the directly conditioned spaces to the indirectly conditioned ones or heat to escape through uninsulated envelopes from directly conditioned spaces to unconditioned spaces), they may be considered heated or conditioned (indirectly) by the same HVAC system that supplies the most important surrounding area". Refer to Appendix 8 of this survey guide for further guidance.

Zones with Air Curtains or Inadequate HVAC

Air curtains are usually designed to prevent cold air entering a space rather than to condition a space.

- Where the air curtain is the only source of heating in the zone, if the output of the heater is less than 10 W/m², the zone is deemed as unconditioned, and "Zone without HVAC System" is assigned. If the output of the heater is greater than 10 W/m², the zone is deemed to be conditioned and HVAC system is assigned.

- Where the air curtain is one of the sources of heating in the zone, it is entered by creating a dedicated zone within the space. Create a zone with width equal to the air curtain or door. Enter a depth equal to the height of the air curtain from finished floor level. Use virtual boundaries where the air curtain zone meets the remainder of the zone.

Occasionally BER Assessors may encounter the use of local heating, often radiant based, which is designed to heat an occupant within an unconditioned work area. Where this occurs, identify the extent of the heated work area, and then create a suitable zone to which is assigned the relevant heating system. If the output of the heater within the area is less than 10 W/m², the zone can be deemed as unconditioned and “Zones without HVAC system” is assigned.

Bivalent System defaults:

In existing buildings there is often little information available to the assessor on the load sharing of systems that make up a bivalent system. The following rules are intended to assist assessors with more realistic apportioning of bivalent components. Section 7.16 of this document contains detailed information on use of the bivalent tab and should be read in conjunction with this section.

- a) Put the central or main system on the normal HVAC tab and the additional system(s) on the bivalent tab. The exception is where heating & cooling is involved; put a system with heating & cooling on the normal HVAC tab and the additional system(s) on the bivalent tab.
- b) If the % annual load share is known use it, otherwise follow the guidance in points c) to f) below.
- c) One multi-zone system and one or more local (single zone) system(s): - 80% is assigned to the central system and 20% to the local system (or equally divided between the local systems).
- d) Two multi zone systems only: - 50% is assigned to each system. To simplify matters, **split systems are considered as multi-zone systems** because they can be central systems.
- e) Two multi zone systems and one or more local (single zone) system(s): - 40% is assigned to each central system and 20% to the local system (or equally divided between the local systems).
- f) No multi zone system and two or more local (single zone) systems: - load is assigned equally to each local system.

For some examples of the application of this guidance please see Section 6.8 in [The NEAP Guidance Document](#).

A4.3 HWS System

iSBEMie Software Tab: "HWS"

Data Entry Item	Default Value
<p>No evidence of a Hot Water Source/Generator present</p>	<p><i>Where no evidence of Storage/ Secondary Circulation Losses Present:</i> "Instantaneous Hot Water only" should be selected with a fuel type selected based on fuel supplied to the unit, "Grid Supplied Electricity" should be selected where oil/gas not present. HWS System Storage/ Secondary Circulation Losses: Not present</p> <p><i>Where evidence of Storage/ Secondary Circulation Losses Present:</i> Where a fuel (oil/gas) is supplied to the building, the HWS System: "Dedicated Hot Water Boiler" should be selected with a fuel type based on fuel supplied to unit. Where oil/gas is not supplied to the building, the HWS System: "Stand-alone water heater" should be selected with a fuel type based on "Grid Supplied Electricity." For the "Tick if the generator is later than 1998" field, base this input on the building age. HWS System Storage/ Secondary Circulation Losses: Based on defaults where evidence not available.</p> <p>Section 3.5.9 of How to use iSBEMie (Volume 2) states that "Depending on the activity and building type selected for the zone, a standard hot water demand is assumed. For example, there is a demand assumed to arise from the occupants of an office for activities such as washing hands and washing cups. This demand is associated with the office rather than the toilet or tea room."</p>
<p>Evidence of a Hot Water System present but cannot be accessed</p>	<p>The BER Assessor is satisfied that there is a hot water generator serving the building, but it cannot be accessed because it is behind fitted furniture or is in a locked or otherwise inaccessible area.</p> <p>Follow the guidance above for "No evidence of a Hot Water Source present."</p>
<p>Hot Water storage vessel insulation if not accessible</p>	<p>The insulation thickness is based on the age of the storage unit as below: If the age of the storage unit is unknown, it must be assumed that the storage unit is the same age as the building. CE marked heaters may be assumed to have at least 25mm of factory insulation.</p> <p>Pre 1994: No Insulation 1994 to 1999: 25mm Factory Insulated Post 1999: 35mm Factory Insulated</p>

A4.4 SES System

iSBEMie Software Tab: "SES"

Data Entry Item	Default Value
Evidence of solar collector present but data unobtainable	If present, the parameters for the calculation are as follows for each unobtainable item: <ul style="list-style-type: none"> • panel aperture area 3 m²; • flat panel, glazed; • facing South, pitch 30°; • combined cylinder, solar part one-third of total, or if a combi boiler the cylinder identified is a dedicated solar cylinder. If combined cylinder is accessible, solar storage volume is portion below the coil directly above the solar heated coil. "Forced circulation system with no PV".
Gross Area obtained from survey	Aperture Area= Flat Plate Glazed Gross Area x 0.9 Aperture Area= Evacuated Tube Gross Area x 0.72

A4.5 PV System

iSBEMie Software Tab: "PVS"

Data Entry Item	Default Value
Evidence of PV present but data unobtainable	If present, the parameters for the calculation are as follows for each unobtainable item: <ul style="list-style-type: none"> • PV area: estimate conservatively from building dimensions, roof pitch and visual information • Type: Other thin film layers • Orientation: Facing South may be assumed, only if orientation is not visible or cannot be estimated during site survey • Inclination: 30° may be assumed, only if inclination is not visible or cannot be estimated during site survey. • Overshading: No default applies, as found during site survey • Ventilation strategy: Unventilated modules

A4.6 Wind Turbine

iSBEMie Software Tab: "Wind generators"

Data Entry Item	Default Value
Evidence of Wind Turbine present but data unobtainable	If present, the parameters for the calculation are as follows for each unobtainable item: <ul style="list-style-type: none"> • Diameter of turbine: Estimate relative to height of turbine • Other Area: Estimate relative to height of building • Height: Estimate relative to height of building • Power (kW) = 60 x Rotor swept area, m² • Terrain Type: No default applies, as found during site survey

A4.7 Shell and Core Buildings

For shell and core buildings not all of the services are installed (especially lighting, mechanical ventilation, and cooling) at the point where the building is sold or let. Buildings (or parts of) that have not previously been sold or occupied and are let or sold as bare structures, without services at all, will nonetheless require a BER.

A "Shell and Core" building or zone would typically be where only the bare structure is in place, internal fittings such as flooring and ceiling finishes, lighting, heating, cooling, or ventilation have yet to be installed. For example, a retail unit to be fitted out at a later date by a tenant.

As the building (or part of) is being sold or let without being fully completed, the BER will be New Build – Provisional. For Shell and Core Buildings, the requirement for demonstrating compliance with the building regulations will be based on the following:

- MPEPC/ MPCPC and RER will be met based on Building Fabric as built, fixed services as installed and design intent for services yet to be installed.
- Once a part of the building has been leased/ sold and fitted out for the first time, a final BER will need to be published for that part of the building. The building must continue to show compliance through an average of the EPC/ CPC and RER for the building.

For example:

Proprietor	Tenant 1
	Tenant 1
	Tenant 2
	Tenant 2
	Tenant 3

A new building has 5 floors, the landlord area has been fitted out with services, while each of the tenant areas are being sold/ leased as a shell.

Compliance is demonstrated by the fixed services in the Landlord Area and the design intent for the 5 tenant areas. The developer plans to lease the tenant areas to 3 tenants.

Tenant 1 acquires floors 4 and 5, once these have been fitted out a final BER must be published for the area leased by Tenant 1. Compliance is demonstrated by taking the average of the EPC/CPC and RER for the building.

The landlord area EPC_L , CPC_L and RER_L is based on Final BER certificate for the Landlord Area

Tenant 1 area EPC_1 , CPC_1 and RER_1 is based on Final BER certificate for Tenant 1.

Tenant 2 and 3, have not yet been fitted out so the $EPC_{2\text{ and }3}$, $CPC_{2\text{ and }3}$ and $RER_{2\text{ and }3}$ are based on the design intent and Provisional BERs.

For a Shell and Core building:

Data Entry Item	Default Value
Proposed Design Available	<p>Where a proposed mechanical and electrical design is available, the HVAC and lighting system are based on the mechanical and electrical specifications, schedules and drawings for the shell and core unit.</p> <p>For compliance with the Part L of the second schedule to the Buildings Regulations, and as outlined in Paragraph 0.1.1.6 of Technical Guidance Document L, for Buildings other than Dwellings, the design and specification should be compatible with the intended building end use and servicing strategy. The renewable requirement of the shell and core building should be installed at an early stage in the construction process to ensure that the building will meet the renewables provision for the whole building when completed. The renewable installation should be based on the RER requirement to achieve Part L compliance, and where full building service installation is not provided until tenant fit-out stage, the RER is calculated based on the intended use/ uses of the building and the proposed mechanical and electrical design for the building as a whole.</p>

Data Entry Item	Default Value
No Design Available ⁵	<p>HVAC System: Select default system “Heating and Mechanical Cooling” which is based on Terminal reheat (constant volume) and air-cooled chiller. For heating the fuel type should be as available on site, where no alternate fuel is present in the building, “Natural Gas” is selected as the heating fuel. Currently electricity is not available as a heating fuel for the default system, “Natural Gas” is selected as it is the heating fuel used in the notional building.</p> <p>A HVAC system is assigned to every zone where the activity type selected for the zone is one which typically requires conditioning (according to the Activity Database), and a red exclamation mark “!” appears.</p> <p>HWS System: “Instantaneous Hot Water only” is selected with a fuel type as available on site, where no alternate fuel is present “Grid Supplied Electricity” should be selected. HWS System Storage/ Secondary Circulation Losses: Not present. Lighting: Lighting Parameters Not Available; Lamp Type: Tungsten. Lighting Controls: Local Manual Switching.</p>

As per the Code of Practice, BER Assessors are required to conduct a full building survey where an Existing or New Final BER certificate is being published or where a Provisional Certificate is being produced for a Shell and Core building which is being built. In the case of Shell and Core buildings this may be just verifying that no services are installed along with collecting other data such as dimensions.

If there is any material change to the data in the BER assessment such as fabric, services for heating, hot water, mechanical ventilation, or air conditioning, the original BER certificate is no longer valid. This applies to all buildings – not just shell and core buildings.

Zone Activity

The previous version of the software included speculative office, speculative industrial space, and speculative retail for use in shell and core situations, but these are no longer available.

When a shell and core type zone is encountered and where no design is available, assessors should apply the most suitable zone type to the zone. This decision should be based on the site survey, granted planning use, the surrounding buildings, and the advertised use of the building.

An open plan “shell and core” office zone will be entered as “Generic Office Area” while a bare retail unit will be a type of “Sales area – general.” In the case of a retail unit the BER assessor will need to select if the “Sales area – general” is for a “Retail Warehouse,” “Department store” or “Small shop.”

An open plan “shell and core” industrial zone will be entered as “industrial process area.”

Assessors are not required to try to guess the location of future interior walls and various other possible zone types to subdivide a bare open plan floor, based on capped drainage or similar, when there is no design available.

⁵ Shell and Core Buildings cannot demonstrate compliance with Part L of the Second Schedule to the Building Regulations without specification of intended servicing strategy.

A4.8 Default exhaust rates

When exhaust fans are encountered in existing buildings a BER Assessor will often have no information on the installed flow rate of the extract system. Where fan data plates can be read the information can be used to enter a non-default value. In the absence of such information the following table lists some default exhaust flow rates to be used.

Description	iSBEMie activity	Assumed extract rate
Store Room	Store Room	6 ACH
Small kitchen or kitchenette or tea making facility with a single extractor fan only. Very limited food preparation activities taking place. (When entering as part of single zone with office space, divide ACH by volume of Tea Making and multiply by volume of zone)	Generic Office (was Tea Making)	10 ACH
Domestic' type kitchen with a single cooker hood extraction unit and limited food preparation activities	Food preparation	15 ACH
Commercial kitchen with multiple cooker hood extraction. Extensive food preparation activities, e.g., kitchen serving restaurant	Food preparation	40 ACH
Toilet	Toilet	6 litres /second per WC/Urinal
Shower/ Bath	Shower/ Bath	15 litres /second per shower/ bath

To convert Air Changes per Hour (ACH) to l/s/m² for entry to iSBEMie:

If Room height = 3.2 m, Extract fan 10ACH

$$3.2\text{m} \times 10\text{ACH} / 3.6 = 8.89 \text{ l/s/m}^2$$

Example A4.8-1

How to use default data from the above table:

A wall fan is present in an office single toilet exterior wall. There are no details available on the fan. The toilet is 5.5m² in area.

There is no supply grille evident, so the system is entered as "Exhaust" only.

There is only one toilet appliance, so an air flow rate of 6l/s is taken from the table above. It is divided by the toilet floor area. 6l/s divided by 5.5m² = 1.09l/s/m²

This value is entered instead of using the default figure of 5 l/s/m². The fan SFP is left as a default.

Example A4.8-2

How to use data from an extract fan:

A specified wall fan can extract 75m³/hr and is to be used in a school staff toilet. The toilet is 14m² in area. The fan uses 15Watts.

Convert the fan extract rate from m³/hr to l/s by dividing by 3.6.

$$75\text{m}^3/\text{hr} = 20.8 \text{ l/s}$$

Divide by the room area to obtain the figure in l/s/m² = 1.49 l/s/m²

This value is entered instead of using the default figure of 5 l/s/m². The fan's SFP can be calculated by dividing 15W by flow rate. This gives an SFP of 15W/20.8 l/s = 0.72W/l/s.

A4.9 Display Lighting

iSBEMie Software Tab: "Zones / Display Lighting"

Data Entry Item	Default Value
Zones incorporate an activity whereby iSBEMie automatically assumes the presence of display lighting.	<p>Where zones incorporate an activity whereby iSBEMie automatically assumes the presence of display lighting, but none is actually present or where the display lighting uses efficient lamps, the display lighting parameter should be adjusted.</p> <p>Where there is no display lighting, the efficiency for iSBEMie is entered based on the general lighting present in that zone.</p> <p>Where possible this should be calculated, but as this requires detailed measurements of the lumen (lm) and circuit watt (cW) this is not usually practical in existing buildings. The following 'default' values are used in the absence of more detailed information:</p> <ol style="list-style-type: none"> 1. Where the general lighting is not using Tungsten or Tungsten Halogen lamps, enter that the display lighting uses efficient lamps and enter the lamps luminous efficacy based on Table 12 of How to use iSBEMie (Volume 2). If there is more than one type, the <u>lowest applicable value</u> from Table 12 should be used. 2. When the general lighting uses Tungsten or Tungsten Halogen lamps; enter that the display lighting does not use efficient lamps. In this case, a "Lumens per circuit wattage" entry is not required. <p>For the purposes of the lighting calculations in iSBEMie, efficient display lighting is one with a lamp and ballast efficacy better than 15 lamp-lumens per circuit-Watt. Where details of Display Lighting are available, the performance in iSBEMie should be updated to reflect performance. Examples of efficient display lighting lamps include: metal halide, compact fluorescent, and white SON (high pressure sodium).</p>

Zone name	Building type	Defaulted Energy intensity W/m ² For information only
Sales area - chilled	All types of retail	10
Store Sales area - electrical	All types of retail	10
Sales area - general	All types of retail	10
Display and Public areas	Museums, Galleries	13.2
Display window	Retail	22
Eating/drinking area	Retail, Restaurants, Cafes, Drinking establishments and Hotels	10
Reception	All types of reception	9

The above table lists zones where display lighting is assumed to be present as well as the applied W/m² where the display lights are left as default efficacy. Always check the display lighting tab for each zone before publication.

Display Lighting Example

A supermarket has T5 Fluorescent - triphosphor-coated - high frequency ballast lighting generally but has a combination of metal halide and compact fluorescent display lighting. No further information is available. The zone lighting is chosen as "T5 Fluorescent - triphosphor-coated - high frequency ballast" and display lighting changed to "Energy efficient lamps". From the table below, metal halide lamps have a lamp efficacy of 50 lamp lumens per circuit Watt for, whilst compact fluorescent lamps have a lamp efficacy of 45 lamp lumens per circuit Watt. Therefore 45 is entered as the display lighting lamp lumen efficacy.

Type	Luminaire efficacy [lm/W]		Lamp efficacy [lm/W]
	Side-lit and unlit	Top-lit	
LED	50	50	50
Tungsten and Halogen	7.5	9	15
Fluorescent-compact	22.5	27	45
T12	25	30	50
T8 low frequency ballast	27.5	33	55
T8 high frequency ballast	32.5	39	65
T8 high frequency ballast, triphosphor	36.3	43.5	72.6
Metal halide	25	39	50
high pressure mercury	22.5	27	45
High pressure sodium	35	42	70
T5	37.5	45	75
Fluorescent-no details	22.5	27	45

The above table lists the Luminous Efficacies of luminaires and the corresponding Lamp Efficacies. Lamp efficacy is what is required for the Display Lighting data field in iSBEMie. Lamp efficacy figures are derived from the NEAP Modelling Guide Table 7 and associated Footnote 16

A4.10 Non-Default km Value

A non-default **km** value (kJ/m²K) is based on the makeup of the construction. As outlined in Section 3.3.1 of How to use iSBEMie (Volume 2), the **km** value is calculated as follows:

km value = density (kg/m³) x thickness (m) x specific heat capacity (kJ/(kgK))

Starting from the layer of the construction closest to the space (interior), add the values together until any one of the following conditions is satisfied:

- The sum of the layer thicknesses has reached 0.1m,
- You have reached the mid-point of the construction or
- You have reached an insulating layer (has a conductivity of 0.08 W/mK or less)

Details of the density for common building materials can be obtained from Appendix A in the current edition of TGD L – Buildings Other Than Dwellings or from CIBSE Guide A.

Details of specific heat capacity for common building materials can be obtained from CIBSE Guide A or from the table below:

Material	Specific Heat Capacity (J/(kgK))
Clay Brickwork	1000
Concrete Block	1000
Cast Concrete	1000
Aerated Concrete Slab	1000

Material	Specific Heat Capacity (J/(kgK))
Concrete Screed	1000
Reinforced Concrete	1000
Mortar	920
External Render	1000
Plaster/ Plasterboard	1000
Natural Slate	840
Clay Tiles	840
Asphalt	920
Felt Bitumen layers	1700
Wood	1700

The following shows an example of how to calculate the **km** value for an external wall:

The wall consists of the following construction layers:

Layer (Inner to Outside)	d (mm)	Conductivity (W/mK)	Density (kg/m ³)	Specific Heat Capacity (J/(kgK))
Plasterboard	13	0.18	600	1000
Concrete block (dense)	100	1.130	2000	1000
insulation	75	0.040	20	1450
Air Gap	50			
Brick outer leaf	105	0.770	1700	1000

As outlined in Section 3.3.1 of How to use iSBEMie (Volume 2), the **km** value is calculated until the sum of layers equals 0.1m or an insulating layer is met, in this case the **km** value is as follows⁶:

$$\begin{aligned}
 &600\text{kg/m}^3 \times 0.013\text{m} \times (1000\text{J/kgK} / 1000\text{J/kJ}) = 7.8 \text{ kJ/m}^2\text{K} \\
 &2000\text{kg/m}^3 \times (0.1 - 0.013)\text{m} \times (1000\text{J/kgK} / 1000\text{J/kJ}) = 174 \text{ kJ/m}^2\text{K} \\
 &\text{km value} = 181.8 \text{ kJ/m}^2\text{K}
 \end{aligned}$$

Appendix 5: Seasonal Efficiency of Heating, Cooling and Ventilation Systems

Assessors must calculate the seasonal efficiency for various heating and cooling systems in buildings. This appendix outlines the details of how the seasonal efficiency is calculated for various systems.

A5.1 Boilers

The “Effective Heat Generating Seasonal Efficiency” is what is required for SBEM.

This is obtained by adding credits to the “Heat Generating Seasonal Efficiency”. If there are no “Heating efficiency credits” available, then the “Heat Generating Seasonal Efficiency” is used.

The “full load” efficiency is the boiler efficiency measured at 100% load. It is not to be entered into iSBEMie. The method for calculation of the “Heat Generating Seasonal Efficiency” is below. An example on the application of “Heating efficiency credits” follows.

⁶ The 0.1m thickness is reached.

A boiler Heat Generating Seasonal Efficiency is based on the gross efficiency calculated at 100% load and 30% load. Under the Ecodesign Directive 813/ 2013, manufacturers are required to publish the efficiency at both loads. The seasonal efficiency is calculated as follows:

$$\text{Boiler seasonal efficiency} = 0.81 \eta_{30\%} + 0.19 \eta_{100\%}$$

Where:

$\eta_{30\%}$ is the gross boiler efficiency measured at 30% load.

$\eta_{100\%}$ is the gross boiler efficiency measured at 100% load

The above equation is used for:

- single LTHW boilers where the output is < 400 kW.
- multiple identical LTHW boilers where output of each boiler is < 400 kW.

For boilers with an output > 400 kW, the manufacturer's declared efficiency should be used.

Fuel	Net-to-gross conversion factor
Natural gas	0.901
LPG (propane or butane)	0.921
Oil (kerosene or gas oil or other biofuel)	0.937
Wood Fuels	0.91
Solid multi-fuel	0.941

Net to Gross conversion factors above are used when suppliers quote net efficiency which need to be converted to gross efficiency.

Example A5.1-1

Single Boiler (and multiple identical boilers) seasonal efficiency calculation:

There is a boiler in a new building. The Make/model were identified during the site survey.

The Assessor sources CE marked datasheet referencing the Boiler Efficiency Directive 92/42/EEC .

The Boiler has the following parameters according to data sheet:

- Natural Gas fuel type
- Net efficiency at 100% load = 94.5%
- Net efficiency at 30% load = 99.5%

Convert net efficiency at 100% load to gross efficiency using the natural gas conversion factor:

$$94.5 \times 0.901 = 85.14\%$$

Convert net efficiency at 30% load to gross efficiency using the natural gas conversion factor:

$$99.5 \times 0.901 = 89.65\%$$

Insert figures into the seasonal boiler efficiency formula.

$$\text{Therefore, seasonal efficiency} = 0.19 \times 85.14 + 0.81 \times 89.65 = 88.8\%$$

Convert to a decimal for use in SBEM = 0.888

Note that **no heating efficiency credits** must be added to the efficiency calculated as above.

This means that the Heat Generating Seasonal Efficiency above can be entered into SBEM without any alterations.

In the case of non-identical multiple boiler systems, the seasonal efficiency is calculated using the weighted average of efficiencies for 3 load conditions:

$$\text{Multiple Boiler seasonal efficiency} = 0.36 \eta_{15\%} + 0.45 \eta_{30\%} + 0.19 \eta_{100\%}$$

Where:

$\eta_{15\%}$ is the gross boiler efficiency measured at 15% load.

The following examples demonstrate how to determine seasonal heating efficiency for (non-identical boilers)

Example A5.1-2

Non-identical multiple boilers seasonal efficiency calculation:

Information from Building Survey:

Heating Load: 200kW This is the heat requirement of the building, available from design engineers. If this figure is not known, in an existing building, make it equal to the combined boiler output (e.g., 300kW if this building’s heat load were unknown)

	Boiler 1	Boiler 2
kW Rating	150kW	150kW
Fuel Type	Gas	Gas
Stage	Lead	Lag
Boiler Efficiency based on Gross Calorific Value from accredited data	90% at 100% load 96% at 30% load	82% at 100% load 86% at 30% load

Using the following table, the seasonal efficiency is calculated as follows:

Boiler No	Rating kW	Boiler % efficiency at boiler outputs of			Boiler % output at system outputs of			Boiler % efficiency at system outputs of			
		100%	30%	15%	30%	100%	15%	30%	100%		
1											
2											
3											
System efficiency at part load											
Weighting factor							0.36	0.45	0.19		
Overall seasonal boiler efficiency											

Boiler No	Rating kW	Boiler % efficiency at boiler outputs of			Boiler % output at system outputs of			Boiler % efficiency at system outputs of		
		100%	30%	15%	30%	100%	15%	30%	100%	
1	150	90	96	20% (1)	40% (1a)	100%	96.9 (3)	95.1 (3a)	90	
2	150	82	86	Not Firing	Not Firing	33% (2)	Not Firing	Not Firing	85.8	
3										
System efficiency at part load							96.9	95.1	89.1 (4)	
Weighting factor							0.36	0.45	0.19	
Overall seasonal boiler efficiency							94.6 (5)			

References in above table as follows:

(1) Calculated based on the following:

$$15\% \times \text{Heating Load (200kW)} = 20\%$$

(1a) (same calculation based on 30% rather than 15%)

$$\text{Boiler 1 Load (150kW)}$$

(2) Calculated based on the following:

$$\text{Heating Load (200kW)} - \text{Boiler 1 Load (150kW)} = 33\%$$

$$\text{Boiler 2 Load (150kW)}$$

(3) Calculated by the linear interpolation,

$$\eta_{b,p} = \eta_{30\%} - (\eta_{30\%} - \eta_{100\%}) * (q_{b,p} - 30\%) / (100\% - 30\%)$$

$$\eta_{1,15\%} = 96 - (96 - 90) * (20\% - 30\%) / (100\% - 30\%)$$

$$\eta_{1,15\%} = 96.9$$

(3a) Similarly calculated by the linear interpolation.

(4) Calculated by dividing the thermal output of the system by the rate of fuel combustion, which is given by the sum of the boiler outputs divided by their individual operating efficiency.

$$\eta_{100\%} = 200 / ((150 * 100\% / 90) + (150 * 33\% / 85.8))$$

$$= 89.1\%$$

(5) Calculated as the weighted average:

$$= 0.36 * 96.9 + 0.45 * 95.1 + 0.19 * 89.1$$

$$= \mathbf{94.6\%}$$

Convert to a decimal for entry in to iSBEMie, (i.e., 0.946).

Credits for controls

Credits for controls can be applied to the seasonal efficiency to account for controls not included within the test results or where default values are used. A maximum of 4 percentage points can be claimed. Note that the efficiency calculated under the Ecodesign and Energy Labelling Directive and shown in manufacturers literature **already accounts** for heating efficiency credits for temperature controls and so none are added. The reasoning is, that for newer builds the measures below are considered standard and not additional.

Table: Heating efficiency credits

Measure	Heating Efficiency Credits	Comments
Boiler oversize <= 20%	2	Unlikely to know in an existing building
Multiple Boilers	1	Includes cascade boiler sets
Sequential control of multiple boilers	1	E.g., Cascade controller on a multiple boiler installation
TRV / Temperature Zone Control	1	Must be on 90% of radiators to use this credit
Weather Compensation	1.5	Check valve charts, boiler room piping, BMS
Room Thermostat	0.5	Where boiler flow temperature is varied
Optimum Start	1.5	Check Building Management System (BMS) for its inclusion
Optimum Stop	0.5	Check BMS for its inclusion
Full Zoned Time Control	1	Where parts of the building have differing operational hours and are timed individually. (Heating zones are not the same as zones in a BER model.)
Full building management system	4	*Check that a BMS is in use in the building
Decentralised heating system	1	Elimination of long pipe runs between buildings to reduce heat loss.

***A maximum of 4 percentage points can be claimed. If a BMS is used then no further credits are available.**

Example A5.1-3:

Application of control credits to a boiler system

Information from Building Survey:

	Boiler 1
kW Rating	300kW
Fuel Type	Gas
Year installed	1999
Seasonal Boiler Efficiency based on SBEM default	81%
Temperature Controls	TRVs on all radiators Weather Compensation Full Zoned Time Control

Using Table above the seasonal efficiency is calculated as follows:

	Heating Efficiency Credits
Boiler Efficiency	81% (iSBEM default for post 1998)
System uses TRVs to ensure full building temperature control	1
There is Weather Compensation fitted	1.5
Full Zoned Time Control	1
Total Credits	3.5

Effective boiler seasonal efficiency:
 = Boiler Efficiency + maximum of 4 heating efficiency credits
 = 81% + 3.5%
 = **84.5%**

Convert to a decimal for entry in to iSBEMie. i.e., 0.845

A5.2 Heat Pump Guidance

The Heat Pump Methodology for Non-Domestic Buildings is currently under development. The following guidance must be followed for demonstrating compliance until such time as the methodology is published.

For Space Heating:

Where a heat pump make/ model is compliant with the Ecodesign and Energy Labelling Directive or has EN 14825 accredited test data, the “Seasonal Space Heating Efficiency” is taken from medium temperature, average climate parameters (55°C) parameters.

In the case where a low temperature heat is being used, the “Seasonal Space Heating Efficiency” can be taken from the low temperature, average climate (35oC) parameters when the heating design calculations confirming the system’s capability to provide the heat required of the system at the lower temperature have been provided. These calculations must be signed off by the heating system designer/commissioning engineer.

The “Seasonal Space Heating Efficiency” taken directly from the Ecodesign declaration (%) is converted by multiplying by 2.5 and divided by 100 for entry into iSBEMie. For example, a Heat Pump with “Seasonal Space Heating Efficiency” of 120% is converted and entered into iSBEMie as follows: $120 \times 2.5 / 100 = 3$.

Note: The factor of 2.5 is based on Ecodesign declared efficiency being based on primary energy of electricity using an EU wide standard primary energy factor of 2.5.

Where there is insufficient documentary evidence available to support the Seasonal Space Heating Efficiency a default value must be used.

Please contact the helpdesk for guidance on hydronic heat pumps with capacity greater than 400kW.

Note: As per section 6.1 of this document Ecodesign regulation 2016/2281 applies to air heating products, which go up to 1MW.

For Hot Water:

Where a Heat Pump is used for water heating, the assessor must select “Heat Pump” as the generator type and cannot select “Same as HVAC” irrespective of the presence or not of a heat pump in the HVAC system.

Where a heat pump make/model is compliant with the Ecodesign and Energy Labeling Directive or has EN16147 test data, the “Water Heating Energy Efficiency” is taken. As with the Space Heating this needs to be converted for entry into iSBEMie.

Where there is insufficient documentary evidence available to support the Water Heating Energy Efficiency a default value must be used.

A5.3 Cooling Seasonal Efficiency

The seasonal efficiency is based on the part load energy efficiency ratios EER measured at 100%, 75%, 50% and 25% operating conditions. Under the Ecodesign Directive, manufacturers are required to publish the part load EERs. The seasonal efficiency is calculated as follows:

$$SEER = a(EER_{100\%}) + b(EER_{75\%}) + c(EER_{50\%}) + d(EER_{25\%})$$

Where;

EER x% is the part load energy efficiency ratio at 100%, 75%, 50% and 25% operating conditions.

a, b, c, and d, are the load profile weightings.

Sample load profiles:

	a	b	c	d
Unknown load profile	0.25	0.25	0.25	0.25
Office load profile	0.03	0.33	0.41	0.23

For existing buildings where only the EER at 100% is known then the SEER is assumed = EER

A5.4 Specific Fan Power

The Specific Fan Power is calculated in accordance with IS EN 13779:2007 Annex D "Calculation and application of specific fan power. Calculating the SFP, SFP_E, SFP_V".

$$SFP = \frac{P_{sf} + P_{ef}}{q}$$

Where:

- SFP is the specific fan power demand of the air distribution system (W/l/s)
- P_{sf} is the total fan power of all supply air fans at the design air flow rate, including power losses through switchgear and controls associated with powering and controlling the fans (W)
- P_{ef} is the total fan power of all exhaust air fans at the design air flow rate including air flow losses through the switchgear and controls associated with powering and controlling the fans (W)
- q is the design air flow rate through the system, which should be the greater of either the supply or exhaust air flow (l/s). Note that for an air handling unit, q is the largest supply or extract air flow through the unit.
- Default SFP figures from SBEM are used where actual data is unavailable.

Note the following Specific Fan Powers should not be used:

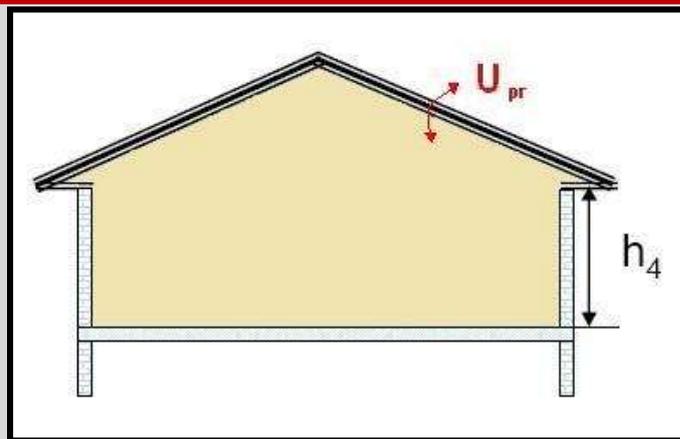
- SFP_E as this accounts for an adjustment for partial load conditions, unless the SFP_E is at 100% design air flow rate.
- SFP_V as this accounts for the validation load conditions rather than the design conditions.
- SFP_{int} as this is the internal specific fan power of the ventilation component determined from a reference configuration.

Appendix 6: Determining Zone Heights and U-Values

Zone Height and Element Areas	
<ul style="list-style-type: none"> For ground and intermediate floors, the zone height is from top of floor slab to top of floor slab. For top floor, the zone height is from top of floor slab to soffit/underside of roof slab. For the purpose of zone height and surrounding wall areas, suspended ceilings and raised floors are ignored. 	<p>The diagram shows a vertical cross-section of a building with five levels. From bottom to top, the zone heights are labeled as h_g (ground floor), h_1, h_2, h_3, and h_4 (top floor). Each height is indicated by a vertical double-headed arrow between the top of one floor slab and the top of the next floor slab above it.</p>
<p>For top floors with pitched roof but flat ceiling:</p> <ul style="list-style-type: none"> Zone height is top of floor to underside of soffit/eaves level - h_4. Area of gable wall is that below soffit/eaves level i.e., $L_4 \times h_4$. U value of Pitched Roof (U_{pr}) is from underside of ceiling to outside roof including insulation irrespective of its location in the roof. 	<p>The diagram shows a building with a pitched roof and a flat ceiling. A horizontal line represents the ceiling level. The zone height h_4 is the vertical distance from the ceiling to the underside of the roof eaves. The length of the gable wall below the eaves is labeled L_4. A red arrow points from the text U_{pr} to the pitched roof surface.</p>
<p>For top floors with pitched roof and dropped ceiling (with or without insulation at ceiling level):</p> <ul style="list-style-type: none"> Zone height is top of floor to underside of soffit/eaves level - h_4. Area of gable wall is that below soffit/eaves level i.e., $L_4 \times h_4$. U value of Pitched Roof (U_{pr}) is from underside of ceiling to outside roof including insulation irrespective of its location in the roof. 	<p>The diagram shows a building with a pitched roof and a dropped ceiling. A horizontal line represents the ceiling level. The zone height h_4 is the vertical distance from the ceiling to the underside of the roof eaves. The length of the gable wall below the eaves is labeled L_4. A red arrow points from the text U_{pr} to the pitched roof surface.</p>

For top floors with pitched ceiling:

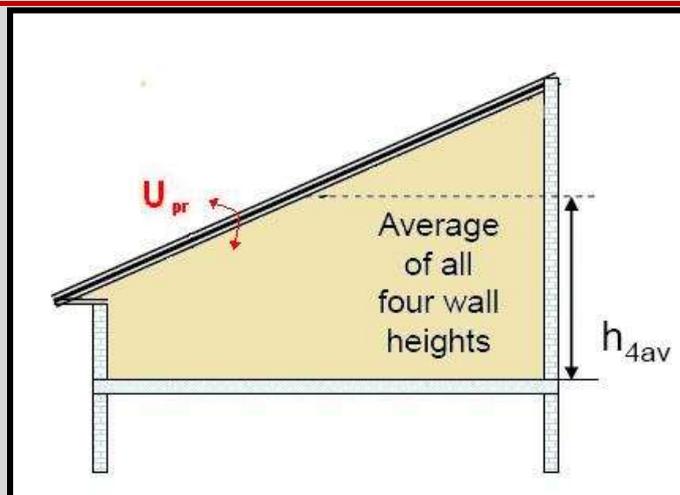
- Zone height is top of floor to underside of soffit/eaves level - h_4 (not average room height)
- Area of gable wall is whole wall up to roof apex (shaded area)
- U value of Pitched Roof (U_{pr}) is from underside of ceiling to outside roof.



Example 6.4

For top floors with mono-pitched ceiling:

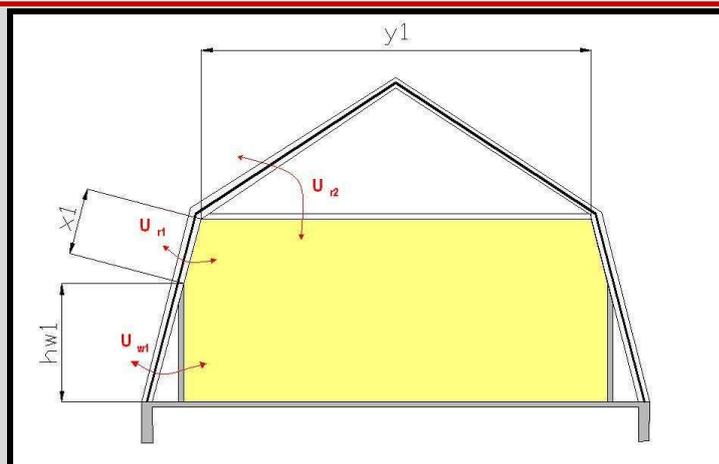
- Zone height is top of floor to weighted average height of all walls - h_{4av} .
- Area of gable wall is whole wall (shaded area)
- Note that zoning for daylight areas must be conducted manually in these circumstances.
- U value of Pitched Roof (U_{pr}) is from underside of ceiling to outside roof.



Example 6.5

For Room in Roof or Mansard Roof:

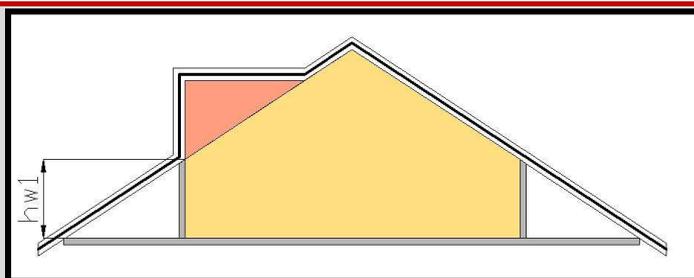
- Zone height ($hw1$) = height of vertical part of wall.
- If $hw1$ varies around the zone, calculate the area weighted average height.
- The U-value ($Uw1$) through the external walls should include any voids as appropriate.
 - The U-value ($Ur1$) through the first roof construction X1 is roof structure only.
 - The U-value ($Ur2$) through the second roof construction Y1 is from underside of ceiling to outside roof including insulation as appropriate and void.



Example 6.6

For Room in Roof with Dormer Window

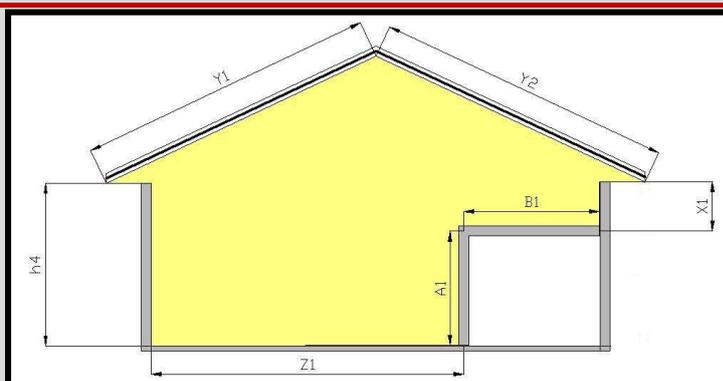
- As per Room in Roof above.
- Zone height ($hw1$) = height of vertical part of wall.
- If $hw1$ varies around the zone, calculate the area weighted average height.
 - Do not adjust zone height for dormer window.
- The external elements, wall, roof and glazing of the dormer window should be included as normal.
- Zone manually for daylight areas (if glazing >20% of vertical wall area)



Example 6.7

For Warehouse with unusable space above adjoining zone:

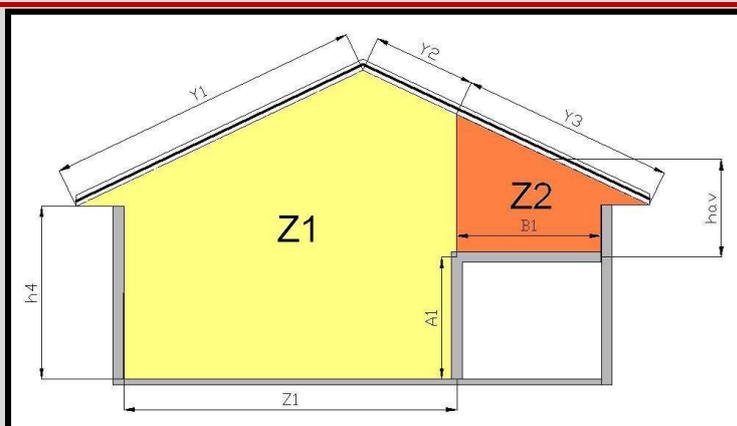
- Zone height is top of floor to underside of soffit/eaves level - $h4$.
- Area of gable wall is whole wall up to roof apex (shaded area)
- Area of roof is $(Y1 + Y2) \times$ length of the zone.
- Height of side walls shown as $X1$ and $h4$
- Area of ground floor and area of zone is $Z1 \times$ length of the zone.
- The internal elements shown as $A1$ and $B1$ should be added as appropriate.



Example 6.8

For Warehouse with usable space above adjoining zone, the warehouse is split into two zones:

- Zone height for $Z1$ is top of floor to underside of soffit/eaves level - $h4$.
- Zone height for $Z2$ is weighted average height of all walls – $h4av$ as per the mono pitched ceiling guidelines.
- Area of gable wall for $Z1$ is whole wall up to roof apex (shaded area in yellow)
- Area of gable wall for $Z2$ is whole wall up to roof apex (shaded area in orange)
- Area of roof in $Z1$ is $(Y1 + Y2) \times$ length of the zone.



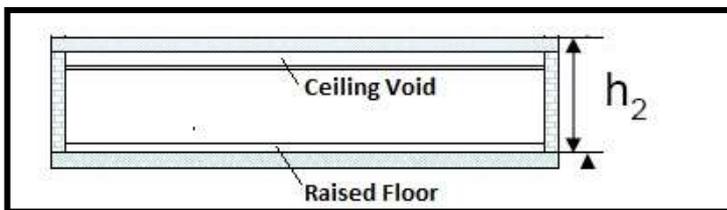
Example 6.9

- Area of roof in Z2 is (Y3) x length of the zone.

Slab Thickness

When there is insufficient proof of the actual slab thickness (not detailed in drawings for example), a default of 250mm is used.

Ensure that where ceiling voids and raised floors exist that these are correctly identified. The depth of the ceiling voids and raised floors is included in the overall height of the zone. Check that documentary evidence is maintained to support entry.



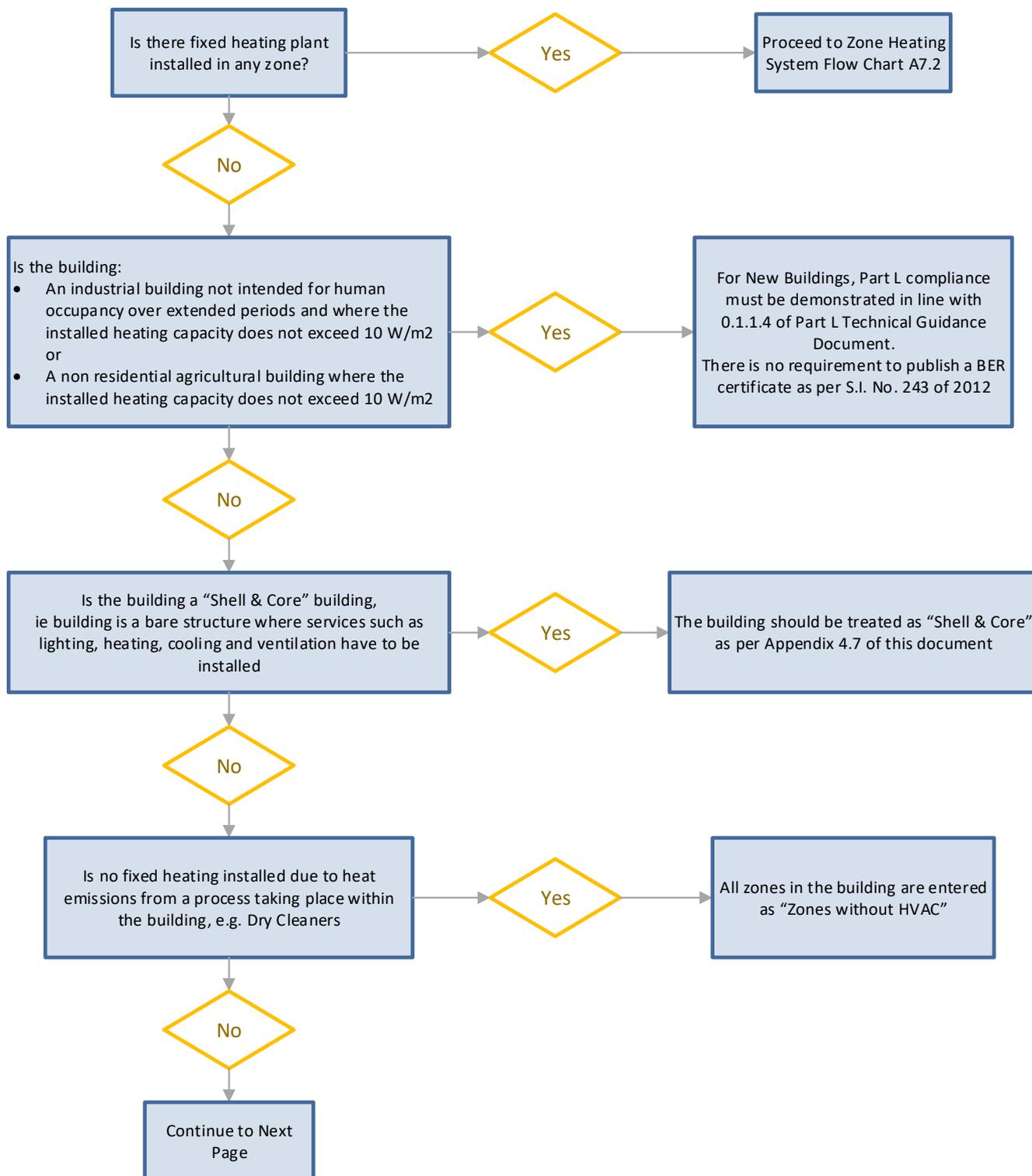
Example 6.10

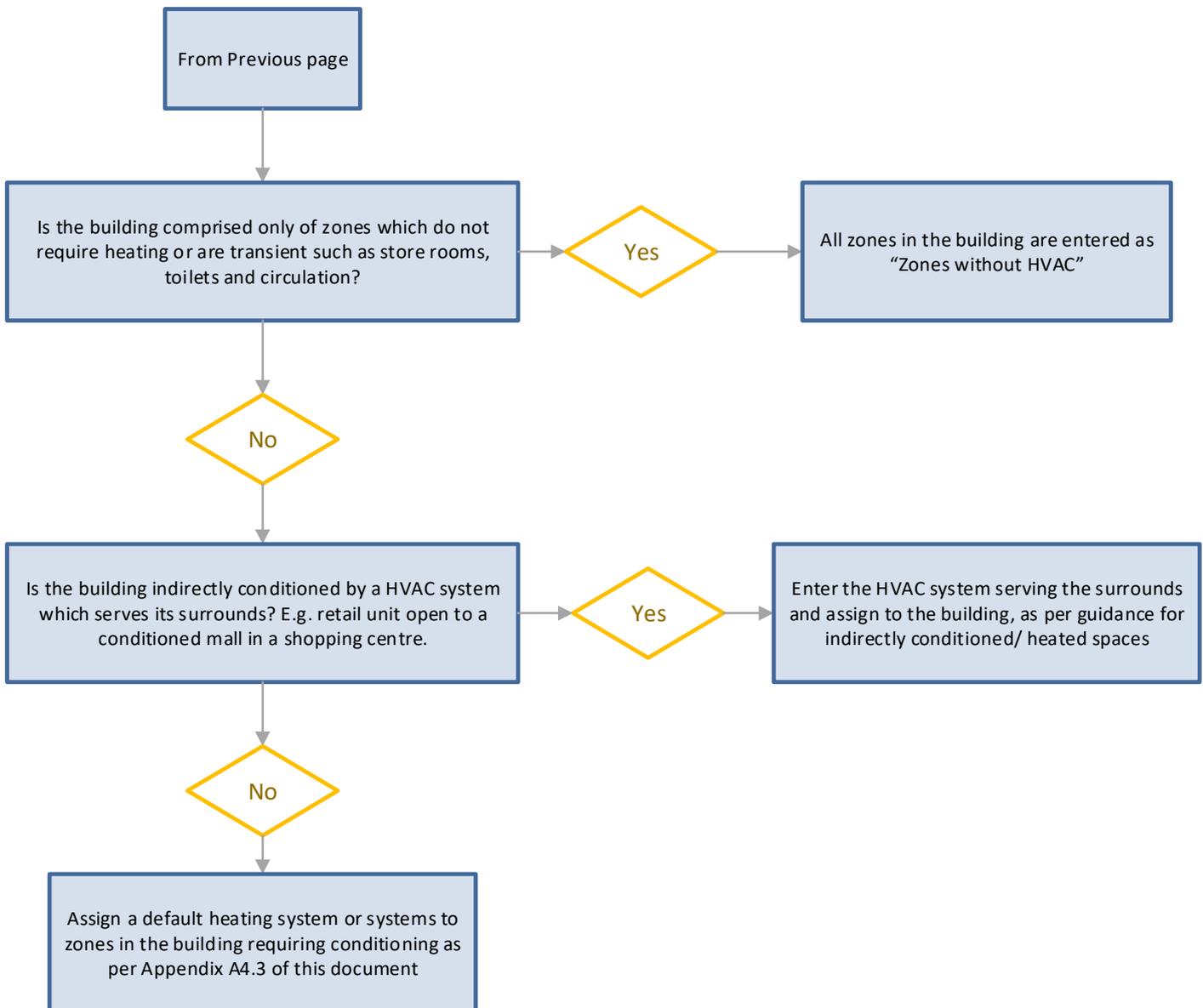
Global Zone Height

A global zone height can be set in iSBEMie under General and Geometry -> Building Details. The value entered is given as the global or default zone height in each of the zones. The zone height can be altered or use the global height for respective zones. Where a zone height differs from the global/default height, select the global button  and enter the actual zone height.

Appendix 7: Identifying the Heating System

A7.1 Building Heating System Flow Chart





A7.2 Zone Heating System Selection Flow Chart

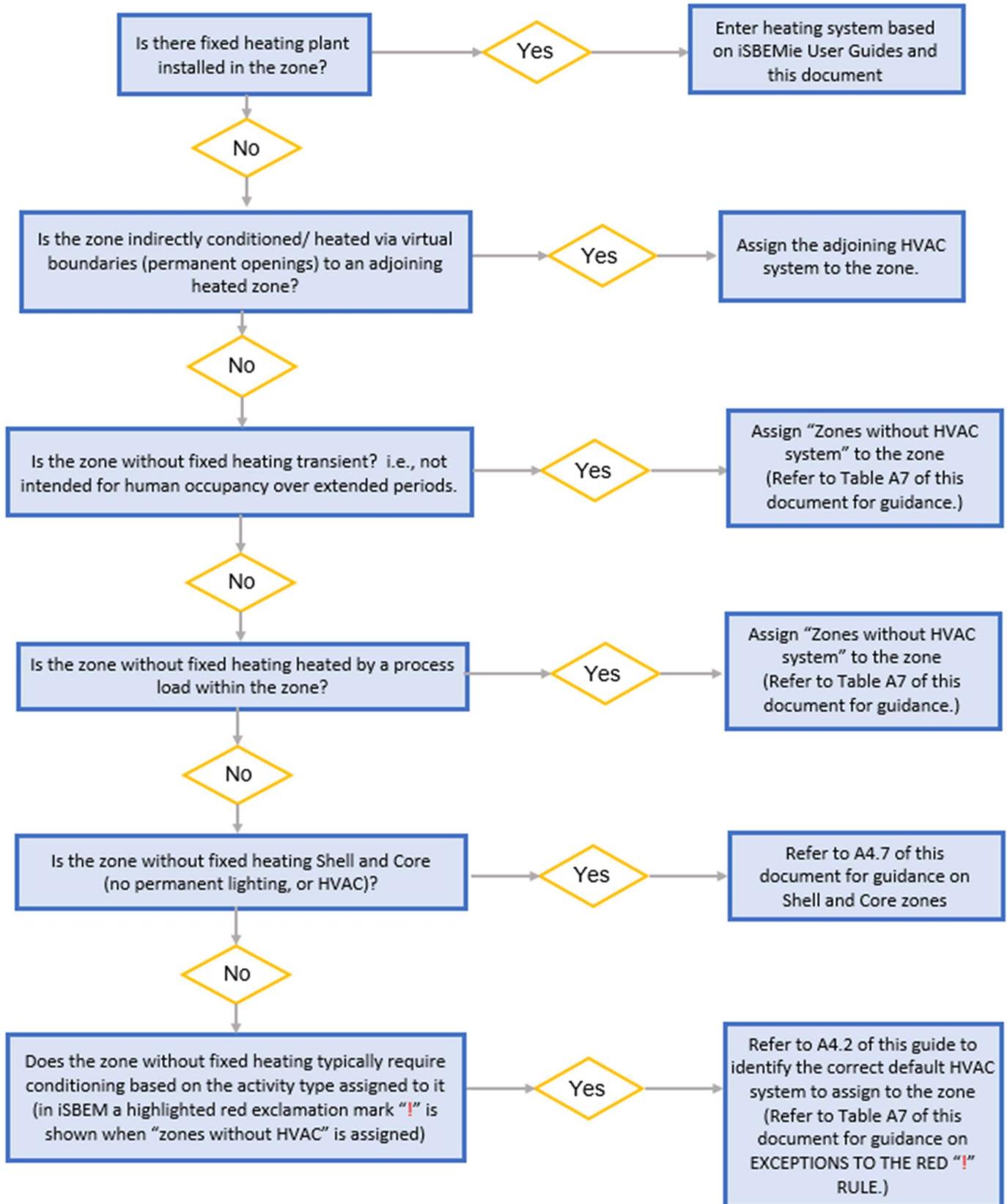


Table A7 Unheated Zones

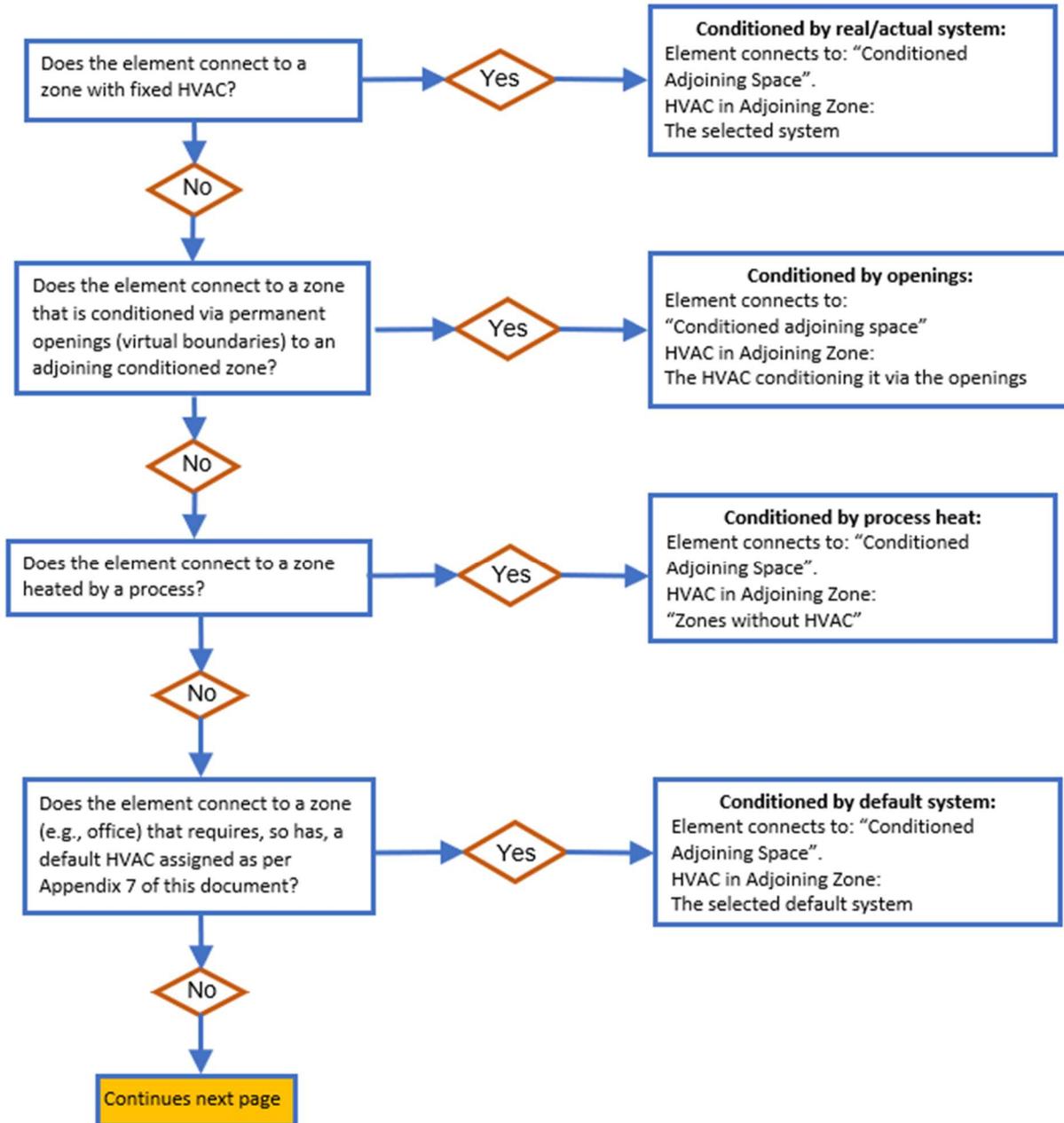
Where a zone is assigned fixed heating or default heating or if a zone has been classified as “indirectly heated;” then the zone is classified as heated and so the guidance in this table does not apply.

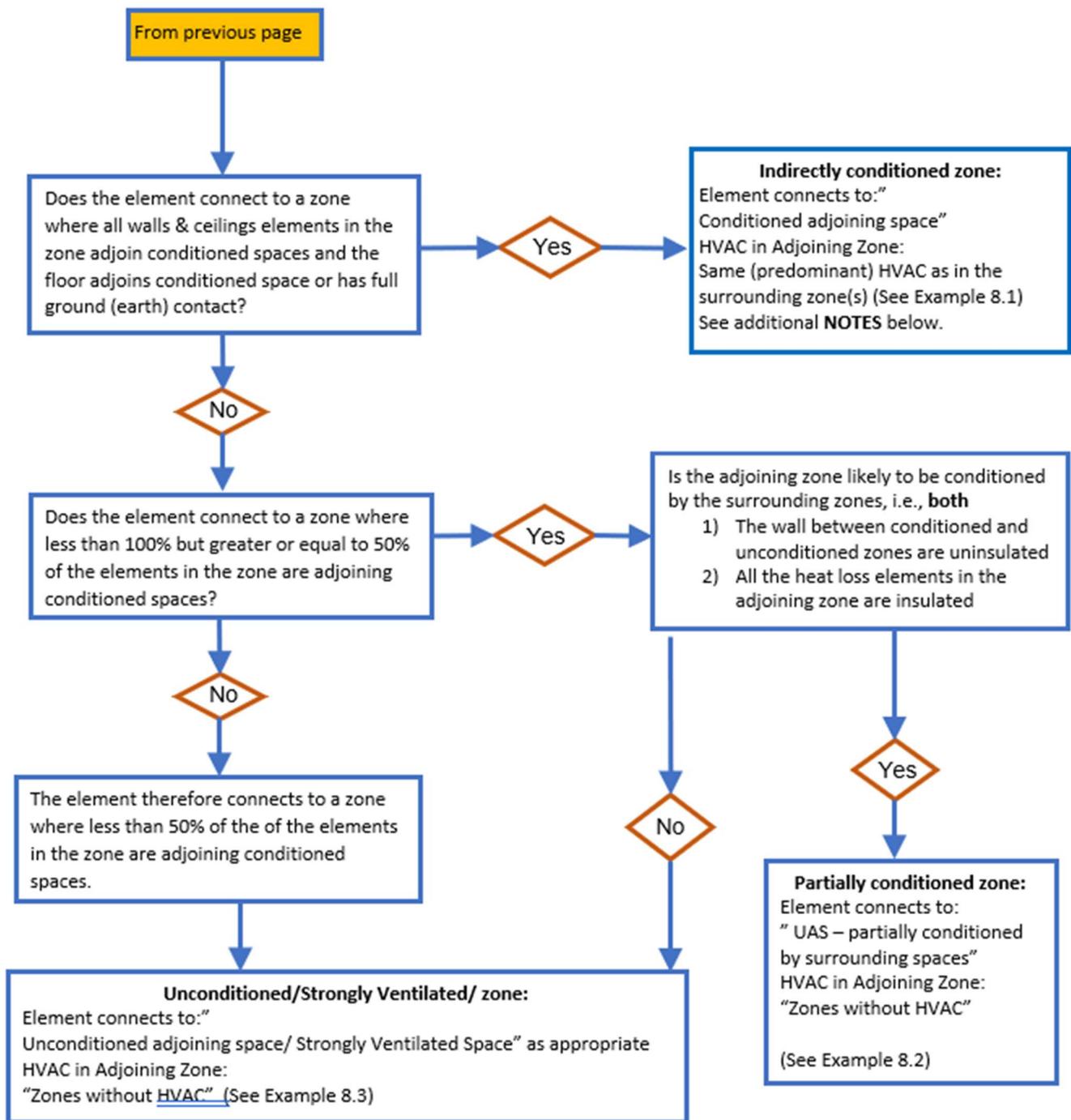
The following outlines examples of unheated zones:

Unheated Parameters	Zone Types to which the parameters apply
<p>The zone does not have any heating and typically does not require conditioning based on the activity type (no red exclamation mark “!” shown in iSBEMie)</p> <p>“Zones without HVAC system” is assigned to the zone.</p>	<p>Storage Areas & Warehouse Storage Circulation Areas (various types) Circulation Areas - except Domestic Circulation Plantrooms Dry sports hall Ice rink SOME Workshop - small scale Industrial process area, SOME Laboratory Lounges (found in Passenger terminals)</p>
<p>The zone does not have any heating but does display the red exclamation mark “!” shown in iSBEMie.</p> <p>The “!” can be ignored for the zones listed on the right on the basis that the zones have transient occupancy.</p> <p>“Zones without HVAC” is assigned to the zone.</p>	<p>Toilets Carparks Common circulation areas (found in Residential spaces) Data centre or server room Heavy Plant Room BER Assessors should contact the helpdesk for assistance if they encounter unheated transient zones, other than the types listed above, that they believe should be entered as “Zones without HVAC system”.</p>
<p>The zone does not have any heating but does display the red exclamation mark “!” shown in iSBEMie.</p> <p>The “!” can be ignored for the zones listed on the basis that they are heated by a process load within the zone.</p> <p>“Zones without HVAC system” is assigned to the zones</p>	<p>IT Equipment - assign HVAC if cooling is present. Data Centre - assign HVAC if cooling is present. Laundry Commercial Food Preparation Areas Heavy Plant Room</p> <p>BER Assessors should contact the helpdesk for assistance if they encounter unheated zones, other than those types listed above, that they believe should be entered as “Zones without HVAC system” because of heating of the space by a process.</p>
<p>The zone does not have any heating, but typically requires conditioning based on the activity type (red exclamation mark “!” shown in iSBEMie) and does not meet conditions above.</p> <p>Default HVAC system assigned to the zone as per NEAP Survey Guide A4.2</p>	<p>Some examples Generic Office Classroom Hall / Lecture Theatre/ Assembly Area Consulting Room Fitness suite/gym And many others</p>

Appendix 8: Assigning Adjacent conditions.

Heat losses through building elements, must be correctly accounted for in the BER assessment. The following flow chart gives details of when to assign alternative conditions.





NOTE 1: A zone without fixed conditioning, being treated as “conditioned adjoining space” by applying adjacent zones’ heating, is NOT considered to be directly conditioned and therefore cannot contribute to indirectly conditioning any other zone. In other words, you cannot continue assigning conditioning to adjacent zones from zones without fixed conditioning. i.e., there is no cascade effect.

NOTE 2: Envelopes to adjacent buildings cannot be used to assess the % contact to CAS. They are to be ignored for the purposes of deciding the % contact.

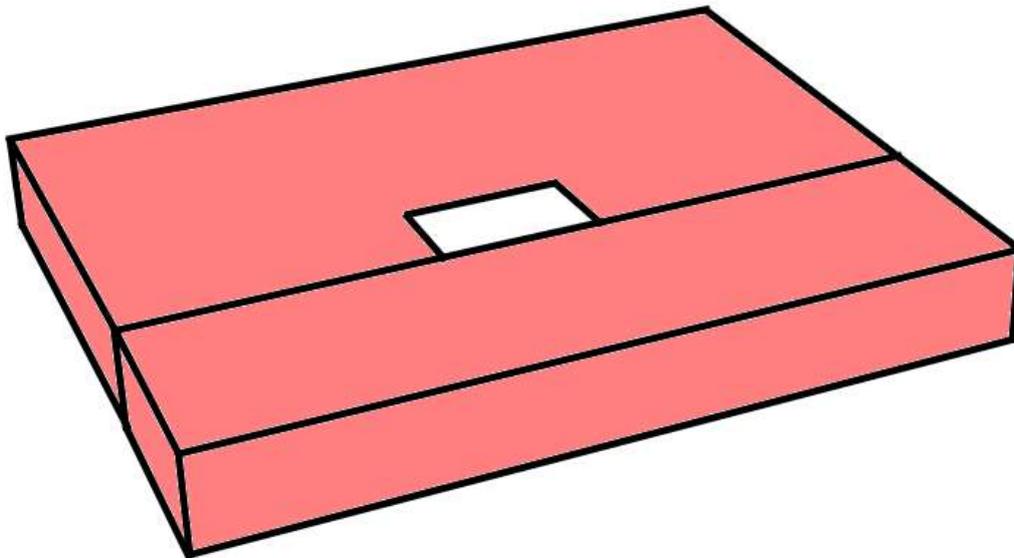
Adjacent Condition Examples:

The following series of examples demonstrate how the adjacent condition is assigned. The white zones have no fixed or default HVAC assigned, while the red zones have HVAC assigned.

Example 8.1: Indirectly Conditioned Zone:

A ground floor storeroom zone with no HVAC, surrounded on four sides by conditioned spaces and with a conditioned space above, not shown. (No heat loss from ceiling of the storeroom zone)

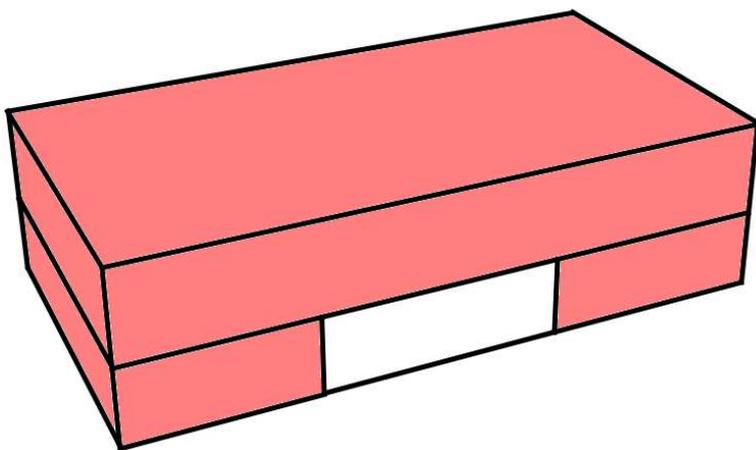
- HVAC Assigned to the unheated storeroom zone: The HVAC of surrounding spaces.
- Elements in areas adjoining the unheated space connect to Conditioned Adjoining Space.
 - This case also applies to mid floor unheated zones, no heat loss from ceiling of the zone.
 - This case does not apply to zones where the underside of the floor or the roof connects to exterior, strongly ventilated or unheated spaces.
 - This guidance will not apply where default heating is assigned to the “unheated” zone, because it is then regarded as heated.
 - The storeroom now has a HVAC assigned. It cannot be assumed conditioned for adjoining evaluation purposes i.e., there is no cascade effect.
 - Walls and floors of adjoining buildings are not included in the consideration of the % of elements contacting conditioned adjoining spaces.



Example 8.2: Partially Conditioned Space:

An unheated storage zone surrounded on three sides and above by conditioned spaces. The total surface area of the elements within the unheated storage zone connected to conditioned surrounding zones is 50% or **greater than 50% of the total of the zone's elements**. The interior walls of the unheated zone are uninsulated, all of the external elements of the unheated zone are insulated.

- HVAC Assigned to the store zone: Zones without HVAC.
- Elements in areas adjoining the unheated space connect to UAS - partially conditioned by surrounding spaces.
- This guidance will not apply where default heating is assigned to the "unheated" zone, because it is then regarded as heated.

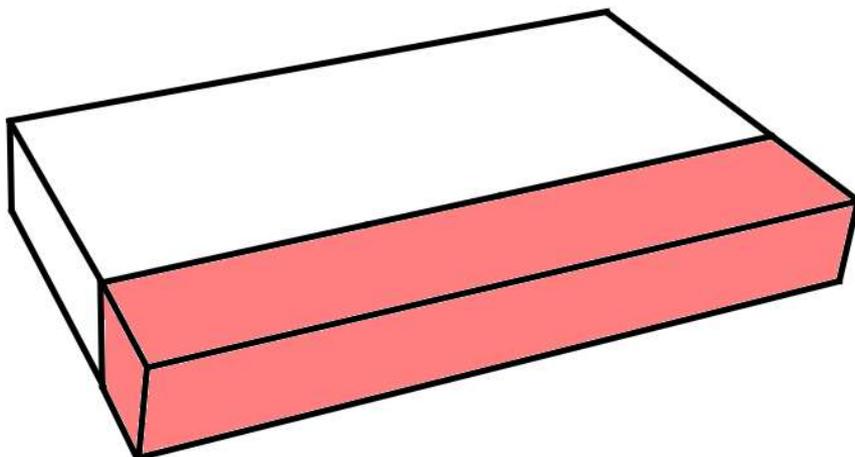


Example 8.3: Unconditioned adjoining space:

A warehouse connected on 1 side to a conditioned office. The total surface area of the elements connecting to the conditioned office is **less than 50%** of the total element areas within the warehouse.

- HVAC Assigned to Warehouse: "Zones without HVAC system."
- Elements in Offices adjoining the warehouse: Unconditioned adjoining space. This is because the conditions in the warehouse are not heated enough by the surrounding spaces for it to be considered conditioned or partially conditioned.

While the Ru value calculation is not mandatory, assessors can still adjust the U value of the element using the external calculation. This may produce a more favorable U value.



Adjoining building is treated as follows in iSBEMie:

- a) "Conditioned Adjoining Space"
- b) "Unheated Adjoining Space" or "Strongly ventilated spaces"

The heating regime of the adjoining building is determined as follows:

Base the parameter for the element on the building type using the following simple matrix showing when a building is adjoining another building whether it is considered conditioned or unconditioned / strongly ventilated.

- CAS - Conditioned Adjoining Space
- Unconditioned Adjoining Space/ Strongly Ventilated Space

Building in BER Assessment	Adjoining Building	Others – Passenger Terminals	Community/Daycare Centre	Primary Health Care Building	Residential Institutions	Restaurant and Cafes/Drinking Establishments and Hot Food	Libraries Museums and Galleries	Offices and Workshop businesses	Residential spaces	Education	Retail and Financial/Professional services	General Assembly and Leisure plus Night Clubs and Theatres	Storage and Distribution	Others - Car Parks 24 hrs.
Others – Passenger Terminals														
Community/Daycare Centre														
Primary Health Care Building														
Residential Institutions														
Restaurant and Cafes/Drinking Establishments and Hot Food														
Libraries Museums and Galleries														
Offices and Workshop businesses														
Residential spaces														
Education														
Retail and Financial/Professional services														
General Assembly and Leisure plus Night Clubs and Theatres														
Storage and Distribution														
Others - Car Parks 24 hrs														

Appendix 9: Determining the Hot Water Storage Volume and Secondary Circulation Losses

Where there is access to the hot water storage unit, determine the storage volume as follows:

- a. Determine the hot water storage volume from a label on the storage unit, provided the label also references a European or National Standard or is CE marked.
- b. Take note of the Manufacturer and Model of the unit and determine the volume from literature from the manufacturer referencing the relevant standards.

- c. Take note of the Manufacturer and Model of the unit and contact the manufacturer regarding the storage volume. The manufacturer must provide written confirmation of the storage volume.
- d. Where data from the above sources is unavailable and the vessel is accessible, measure the volume of the unit on site. Further detail on this is provided below.
- e. Where the hot water storage vessel is inaccessible, documentary evidence from the installer, architect or engineer identifying the volume of the installed vessel is used.
- f. If none of these options are possible base it on the iSBEMie default.

Calculation of storage vessel losses from a label or data sheet:

Standing loss figures are often expressed in Watts, e.g., a 300l vessel is stated as having standing losses of 97W.

Convert this to kWh/24hrs: $97W \times 24hrs / 1000W/kW = 2.328 \text{ kWh /24hrs}$

Convert to Mega Joules by x 3.6 gives: 8.38 MJ/24hrs.

Convert to MJ/month for iSBEMie entry by x 30 gives: 251 MJ/month.

Other BER software can use different units so please ensure the correct units are used.

Measuring a Hot Water Storage Cylinder:

- 1) Measure the height and diameter of the hot water storage vessel.
- 2) The volume is calculated based on the following:

$$V = (\pi \times r^2) \times h / 1000$$

Where: r = radius of the unit (cm)

h = height of the unit (cm)

$\pi = 3.142$

V = volume of unit (litres)

For Enclosed Water Heaters:

Enclosed water heaters often have the volume displayed on a sticker near the top of the heater. If this is not readable then the water heater volume is calculated by recording the height, width, and depth of the water heater if the heater is cuboid or the above formula if cylindrical. The cuboid volume is then calculated as follows:

$$V = h \times d \times w \times 1000$$

Where: d = depth of unit (m) minus the insulation thickness as appropriate.

h = height of unit (m) minus the insulation thickness as appropriate.

w = width of unit (m) minus the insulation thickness as appropriate

V = volume of the cylinder (litres)

For example:

The diagram below shows a water heater with measured dimensions on site for a unit installed in 2005. The default insulation thickness is therefore 35mm. Refer to Appendix A4.3 of this document for guidance on insulation thickness.



The volume of the storage unit is therefore: **V = h x d x w x 1000**

$$h = 550 - (35 \times 2) = 480\text{mm}$$

$$d = 330 - (35 \times 2) = 260\text{mm}$$

$$w = 330 - (35 \times 2) = 260\text{mm}$$

Volume = 0.48 x 0.26 x 0.26 x 1000 = 32 litres

Secondary Circulation Losses:

Insulation of hot water pipework can be accounted for in the iSBEMie calculation. The table below gives indicative thickness of insulation for non-domestic hot water services to meet the maximum permissible heat loss set out in the current edition of TGD L 1 – Buildings Other than Dwellings published on the gov.ie website. In order to demonstrate compliance with Part L, the heat losses shown in Table G1 of TGD L for different pipe sizes and temperatures should not be exceeded. Heat loss from uninsulated pipes should only be permitted where the heat can be demonstrated as “always useful”.

Outside diameter of pipe on which insulation thickness has been based mm	Water temperatures at 60°C for hot water with ambient still air of 15°C.					
	Thermal Conductivity at insulation mean temperature W/mK					Maximum permissible heat loss W/m
	0.025	0.030	0.035	0.040	0.045	
	Thickness of insulation					
17.2	12	17	23	31	41	6.60
21.3	14	19	25	33	43	7.13
26.9	15	21	27	35	45	7.83
33.7	17	22	29	37	47	8.62
42.4	18	23	30	38	47	9.72
48.3	19	25	32	40	49	10.21
60.3	20	26	33	41	50	11.57
76.1	22	28	35	43	52	13.09

Outside diameter of pipe on which insulation thickness has been based mm	Water temperatures at 60°C for hot water with ambient still air of 15°C.					
	Thermal Conductivity at insulation mean temperature W/mK					Maximum permissible heat loss W/m
	0.025	0.030	0.035	0.040	0.045	
	Thickness of insulation					
88.9	22	28	35	43	51	14.58
114.3	23	29	36	43	51	17.20
139.7	24	31	37	44	52	19.65
168.3	25	32	38	45	53	22.31
219.1	26	32	38	45	52	27.52
273 and above	27	33	39	46	53	32.40

(Ref The TIMSA HVAC Guidance Document)

For entering the data into iSBEMie the assessor must get the average w/m, for example:

Hot Water Secondary Circulation installed with following pipework length and heat loss:

100m of 17.2 dia pipe with 6.60 W/m heat loss for this diameter

50m of 33.7 dia pipe with 8.62 W/m heat loss for this diameter

10m of 76.1 dia pipe with 13.09 W/m heat loss for this diameter

$$\text{Average loss in W/m} = \frac{(100 \times 6.6) + (50 \times 8.62) + (10 \times 13.09)}{100 + 50 + 10} = 7.64 \text{ W/m}$$

Appendix 10: Selection of Solid Fuel Type, Open Fires & Stoves

10.1: Selection of solid fuel type:

Solid fuel appliances can be fueled by coal, anthracite, smokeless fuel, dual fuel (mineral and wood) and biomass. For solid fuel boilers and heaters, the fuel type is chosen as follows, proceeding from points 1 towards 3 until a choice is made:

1. If the heating appliance is designed to burn only biomass, i.e., its design is such as to prohibit the use of any other fuel type, then the appropriate fuel type (biomass) should be selected. Otherwise, biomass should not be selected. This can be demonstrated by one of the following:
 - Documentation showing that the product warranty is void if the product is used with any fuel type other than biomass.
 - Listing of the product under <http://www.hetas.co.uk/> showing that the appliance burns biomass only.

Where there is any doubt about fuel type selection biomass should not be selected.

2. If the appliance is designed to burn a particular coal-based or peat-based fuel type, then that should be chosen as the fuel.
3. If the appliance can burn more than one fuel type, the most likely non-biomass type should be selected based on (a) the appliance design, and (b) the building location (taking account of smoke control areas and fuels common in the area).

The following table summarises the information above:

Scenario	Biomass	Manufactured smokeless fuel
Appliance can only burn biomass	Yes	No
Appliance can burn multiple solid fuels	No	Yes ⁷

10.2: Open fires & stoves

Open fires and stoves can be encountered in older buildings and some public houses. The following table describes the entries.

"Appliance"	System Type	Heat Source	Fuel Type	Seasonal Efficiency
Open Fire	Other local room heater - unfanned	Room Heater	Refer to guidance above	Enter 0.3
Stove	Other local room heater - unfanned	Room Heater	Refer to guidance above	Use the default 0.7 unless a non-default figure can be obtained

Where another heating source, e.g., central heating using a boiler is present a bi-valent system may be required, or the space may need to be zoned appropriately.

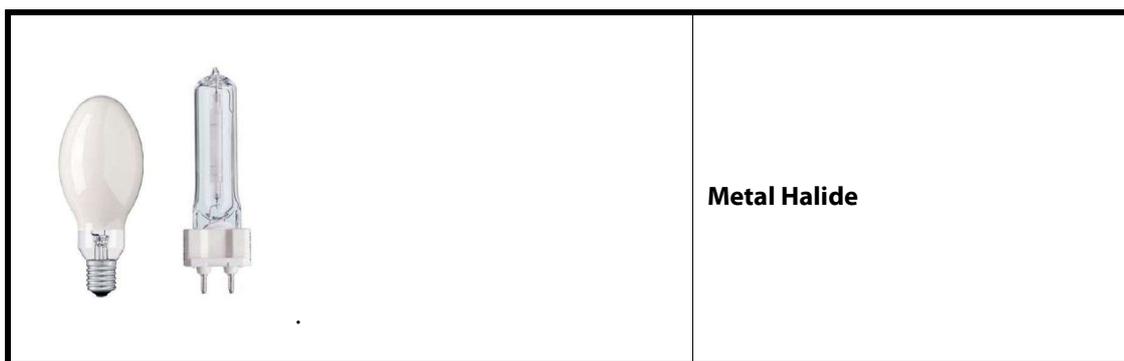
If the BER Assessor can determine that the chimney has been closed the appliance can be ignored.

Appendix 11: Identifying Common Lighting Systems

The following are examples of various lighting systems:

⁷ In line with new regulations which came into effect on Oct. 31, 2022, on the ban on the sale of smoky coals, turf, and wet wood.

	<p>Tungsten Lamps or Tungsten Halogen Lamps</p>
	<p>Compact Fluorescents</p>
	<p>Tubular Fluorescents</p> <p>T5: 16mm diameter T8: 26mm diameter T12: 38mm diameter</p>
	<p>LED (Light Emitting Diodes)</p> <p>Can be a completely new fitting or an existing fitting where an LED lamp replaces a less efficient lamp.</p>



Appendix 12: Fuel Conversion Factors

The following table lists the Fuel Conversion Factors and Primary Energy Factors used by iSBEMie.

Fuel type	kgCO ₂ /kWh	Non-Renewable Primary Energy Factor kWh/kWh	Renewable Primary Energy Factor kWh/kWh
Natural gas	0.203	1.1	0
LPG	0.232	1.1	0
Biogas	0.025	0.1	1
Fuel oil	0.272	1.1	0
Coal	0.361	1.1	0
Anthracite	0.361	1.1	0
Manufactured smokeless fuel	0.392	1.2	0
Dual fuel (mineral + wood)	0.289	1.1	0
Biomass	0.025	0.1	1
Waste Heat	0.018	1.05	0
Grid supplied electricity	Grid Electricity*	Grid Electricity*	0
Grid displaced electricity	Grid Electricity*	Grid Electricity*	0
Electricity produced by renewables (PV/ Wind)	-	0	Grid Electricity*
Solar Thermal	-	0	1
Heat Pump (Environmental Energy)	-	0	1

District Heating – approved defaults for selected Efficient District Heating Schemes Selected Efficient District Heating Schemes may use approved default factors as outlined in separate guidance available from the SEAI website.

**As published on the SEAI Website*



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