Rialtas na hÉireann
Government of Ireland

Supporting Documentation to demonstrate compliance with the requirements of Part L & F

NBC&MSO – 23rd September 2025

Emmanuel Bourdin
Climate and Construction Innovation Unit
Department of Housing, Local Government and Heritage

Part L and Part F for new dwellings

The Second Schedule to the Building Regulations, insofar as it relates to works relating to dwellings, provides as follows:

L1 A building shall be designed and constructed so as to ensure that the energy performance of the building is such as to limit the amount of energy required for the operation of the building and the amount of carbon dioxide (CO_2) emissions associated with this energy use insofar as is reasonably practicable.

L2 For existing dwellings, the requirements of L1 shall be met by:

(a) limiting heat loss and, where appropriate, availing of heat gain through the fabric of the building;

(b) controlling, as appropriate, the output of the space heating and hot water systems;

(c) limiting the heat loss from pipes, ducts and vessels used for the transport or storage of heated water or air;

(d) providing that all oil and gas fired boilers installed as replacements in existing dwellings shall meet a minimum seasonal efficiency of 90 % where practicable.

L2A

(a) A multi-unit building containing one, or more than one, dwelling:

(i) that is new, or

(ii) subject to paragraph (b), undergoing major renovation,

shall have installed ducting infrastructure (consisting of conduits for electrical cables) for each car parking space, to enable the subsequent installation of recharging points for electric vehicles where the parking space is:

(i) located inside the building concerned, or

(ii) is within the curtilage of the building concerned.

(b) The requirement of paragraph (a) shall apply to a building undergoing major renovation where:

(i) in a case where the car park is located inside the building, the renovations concerned include the car park or the electrical infrastructure of the building, or

(ii) in a case where the car park is physically adjacent to the building, the renovations concerned include the car park or the electrical infrastructure of the car park.

(c) A new building that is a dwelling, other than where the dwelling forms part of a multi-unit building, where a parking space is located within the curtilage of the dwelling, shall have installed appropriate electric vehicle recharging infrastructure to enable the subsequent installation of recharging points for electric vehicles.

L6 Energy performance of buildings requirements as set out in the European Union (Energy Performance of Buildings) Regulations 2019.

The European Union (Energy Performance of Buildings) Regulations 2019 (S.I. No. 183 of 2019), insofar as it relates to works relating to dwellings, provides as follows:

Regulation 7

When a dwelling undergoes major renovation, the minimum energy performance requirement of the dwelling or the renovated part thereof is upgraded in order to meet the cost optimal level of energy performance in so far as this is technically, functionally and economically feasible.

Regulation 8

For new dwellings, the nearly zero energy performance requirements of this regulation shall be met by:

(a) providing that the energy performance of the building is such as to limit the calculated primary energy consumption and related carbon dioxide (CO_2) to that of a nearly zero energy building within the meaning of the Directive insofar as is reasonably practicable, when both energy consumption and carbon dioxide (CO_2) emissions are calculated using the Dwelling Energy Assessment Procedure (DEAP) published by Sustainable Energy Authority of Ireland;

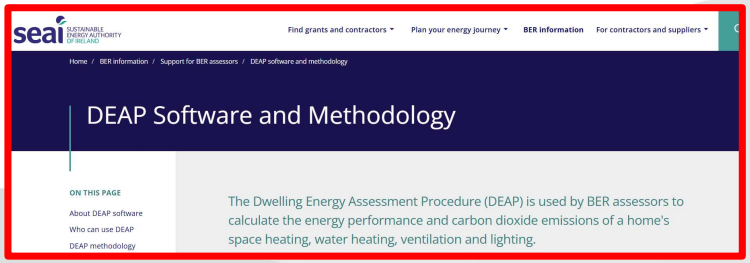
(b) providing that, the nearly zero or very low amount of energy required is covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby;

(c) limiting the heat loss and, where appropriate, availing of heat gain through the fabric of the building;

(d) providing and commissioning energy efficient space and water heating systems with efficient heat sources and effective controls;

(e) providing that all oil and gas fired boilers shall meet a minimum seasonal efficiency of 90 %;

(f) providing to the dwelling owner sufficient information about the building, the fixed building services, controls and their maintenance requirements so that the building can be operated in such a manner as to use no more fuel and energy than is reasonable.



The European Union (Energy Performance of Buildings) Regulations 2021 (S.I. No. 393 of 2021), insofar as it relates to works relating to dwellings, provides as follows:

Regulation 5

(a) A new building shall, where technically and economically feasible, be equipped with self-regulating devices for the separate regulation of the temperature in each room or, where justified, in a designated heated zone of the building unit.

(b) Where a heat generator is being replaced in an existing building, where technically and economically feasible, self-regulating devices shall also be installed.

For the purpose of giving effect to Article 15(4) of Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018, the European Union (District Heating) Regulations 2022 (S.I. No. 534 of 2022) provides as follows:

Regulation 3

The minimum levels of energy from renewable sources, referred to in Article 15(4) of the Directive, may be fulfilled through efficient district heating and cooling using a significant share of renewable energy and waste heat and cold.

Part F of the Second Schedule to the Building Regulations 1997 is amended by Building Regulations (Part F Amendment) Regulations 2019 (S.I. No. 263 of 2019) to read as follows:

Means of ventilation	F1	Adequate and effective means of ventilation shall be provided for people in buildings. This shall be achieved by: (a) limiting the moisture content of the air within the building so that it does not contribute to condensation and mould growth, and (b) limiting the concentration of harmful pollutants in the air within the building.
Condensation in roofs	F2	Adequate provision shall be made to prevent excessive condensation in a roof or in a roof void above an insulated ceiling.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L series
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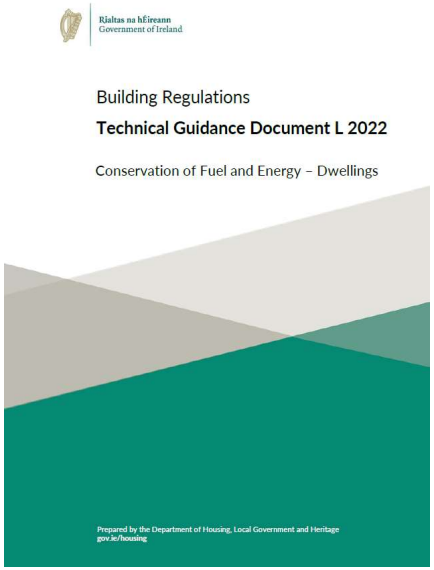
DIRECTIVE (EU) 2024/1275 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 24 April 2024
on the energy performance of buildings
(recast)

TGD L Dwellings and TGD F



The Guidance

The materials, methods of construction, standards and other specifications (including technical specifications) that are referred to in this document are those which are likely to be suitable for the purposes of the Building Regulations (as amended). Where works are carried out in accordance with the guidance in this document, this will, *prima facie*, indicate compliance with Part L of the Second Schedule to the Building Regulations and the European Union (Energy Performance of Buildings) Regulations.

However, the adoption of an approach other than that outlined in the guidance is not precluded provided that the relevant requirements of the Regulations are complied with. Those involved in the design and construction of a building may be required by the relevant building control authority to provide such evidence as is necessary to establish that the requirements of the Regulations are being complied with.

TGD L Dwellings *Prima Facie* Compliance for new dwellings

0.1.2 New Dwellings

0.1.2.1 For new dwellings, the key issues to be addressed in order to ensure compliance are:

Whole Dwelling Performance

TGD L Section 1.1:

Calculation in DEAP achieving MPEPC (0.3) and MPCPC(0.35)

This is equivalent to 70% improvement on 2005 Regulations.

+

Individual Minimum Performance Levels Compliance

TGD L Sections:

1.2 Renewable Energy Ratio ≥ 0.20

1.3 Building Fabric
- U-Values backstop (1.3.2)
  - Elemental backstop values: area-weighted average and individual element (Table 1)
  - Combined heat loss backstop value (1.3.2.3)
- Thermal Bridging ACDs (1.3.3) – **[Simon McGuinness]**
- Air Permeability ≤ $5m^3/(h.m^2)$ (1.3.4)
- Limiting Heat Gains (1.3.5)

1.4 Building Services
- Boiler Efficiency 90% (1.4.2)
- Space Heating Controls (self-regulating devices) (1.4.3)
- Insulation of Hot Water Storage Vessels, Pipes and Ducts (1.4.4)
- Mechanical Ventilation System Efficiency (1.4.5)
- EV Recharging Infrastructure (1.4.6)

1.5 Construction Quality and Commissioning of Services

1.6 User Information

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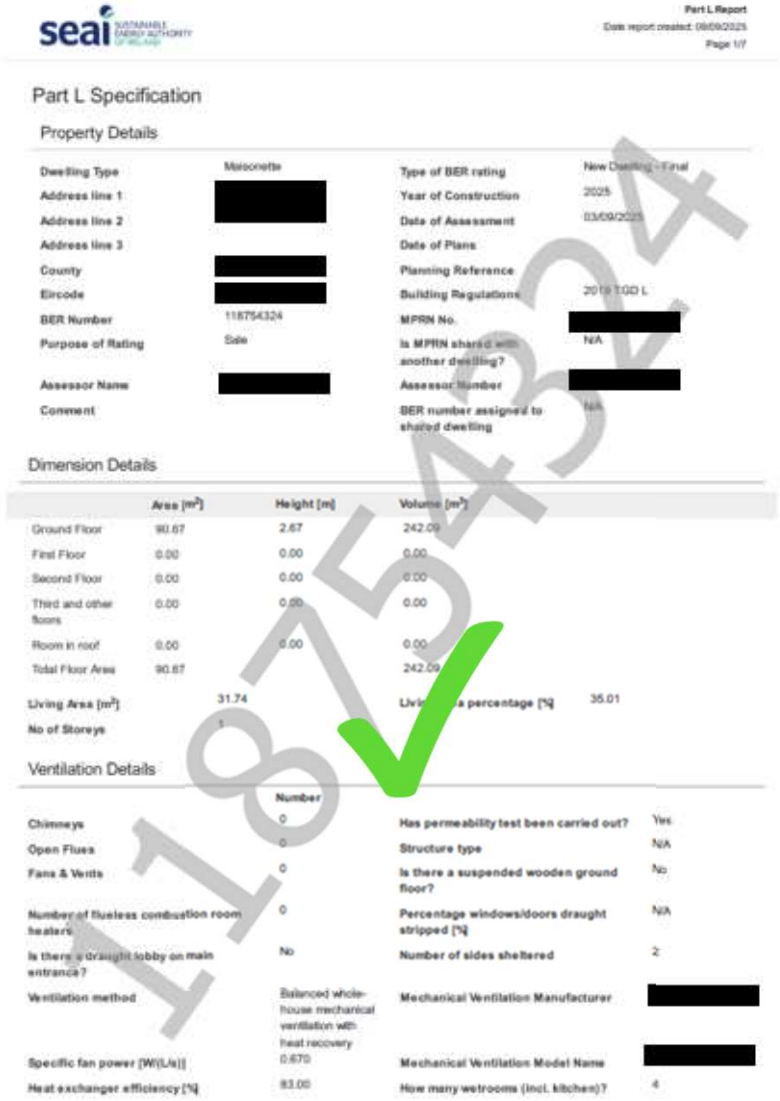
Compliance with Part L Dwellings

1.1.4 **The requirements that the calculated EPC and CPC do not exceed the calculated MPEPC and MPCPC respectively, applies to the constructed dwelling.** It is considered good practice for designers to calculate the EPC and CPC at early design stage in order to ensure that the requirements can be achieved by the constructed building. It is also open to professional bodies or other industry interests to develop model dwelling designs that can confidently be adopted without the need to calculate the EPC and CPC at design stage. **However, the use of constructions and service systems which have been assessed at design stage, or other model designs, does not preclude the need to verify compliance by calculating the EPC and CPC when all relevant details of the final construction are known.**

DEAP Part L Compliance report



DEAP Part L Compliance report

Summary for Part L Conformance (Applies to TGD L 2008/2011/2019 for new dwellings only)

BER Number	118754324	**Building Regulations**	**2019 TGD L**
BER Result	A2	**Energy Value kWh/m²/yr**	**39.56**
CO_2 emissions [kg/m²/yr]	5.06		
EPC	0.254	**EPC Pass/Fail**	**Pass**
CPC	0.166	**CPC Pass/Fail**	**Pass**

Part L Conformance - Renewables (applies to TGD L 2019)

	Source	Renewables Primary Energy	Total Primary Energy	RER
+ Delivered energy	**PV/Wind**	**0.00**	**0.00**	
+ Delivered energy	**Other**	**0.00**	**0.00**	
+ Delivered energy	**Solar**	**0.00**	**0.00**	
+ Delivered energy	**Biomass**	**0.00**	**0.00**	
+ Delivered energy	**Biodiesel**	**0.00**	**0.00**	
+ Delivered energy	**Bioethanol**	**0.00**	**0.00**	
+ Environmental energy	**HP**	**3827.81**	**3827.81**	
+ Saved energy	**CHP**	**0.00**	**0.00**	
+ District heating	**District Heating**	**0.00**	**0.00**	
+ Delivered energy	**Grid**	**0.00**	**3586.62**	
+ Delivered energy	**Thermal**	**0.00**	**0.00**	
SUBTOTAL		**3827.81**	**7414.43**	**0.52 - Pass**
Energy not used in Regulated Loads	**PV/Wind/CHP**	**0.00**	**0.00**	
TOTAL		**3827.81**	**7414.43**	**0.52**

DEAP Part L Compliance report

RGY SUMMER INTERNAL TEMPERATURE

PART L COMPLIANCE (BUILDING FABRIC)

CONFORMITY WITH MAX AVG U-VALUE REQUIREMENTS

Avg elemental U-Values [W/m²K]	
Pitched roof insulated on slope	0.000
Pitched roof insulated on ceiling	0.130
Flat roof	0.000
Floors with no underfloor heat	0.180
Floors with underfloor heat	0.000
Walls	0.180
Percentage of opening areas [%]	15.575
Average U-value of openings	0.720

CONFORMITY WITH MAX U-VALUE REQUIREMENTS

Max elemental U-Values [W/m²K]	
Roofs	0.130
Walls	0.180
Floors	0.180
External doors windows/rooflights	0.720

Table 1 Maxi… elemental U-value W/m²K)[1, 2]

Column 1 Fabric Elements	Column 2 Area-weighted Average Elemental U-valu… (Um)	Column 3 Average Elemental U-value – individual element or section of element
Roofs		
Pitched roof - Insulation at ceiling - Insulation on slope	0.16 0.16	0.3
Flat roof	0.20	
Walls	0.18	0.6
Ground floors[3]	0.18	0.6
Other exposed floors	0.18	0.6
External doors, windows and rooflights	1.4[4,5]	3.0

Notes:
1. *The U-value includes the effect of unheated va… spaces.*
2. *For alternative method of showing compli… 1.3.2.3.*
3. *For insulation of ground floors and exposed fl… incorporating underfloor heating, see paragra…*
4. *Windows, doors and rooflights should have a … value of 1.4 W/m²K.*
5. *The NSAI Window Energy Performance Sche… provides a rating for windows combining … solar measures*

PART L COMPLIANCE (BUILDING FABRIC)

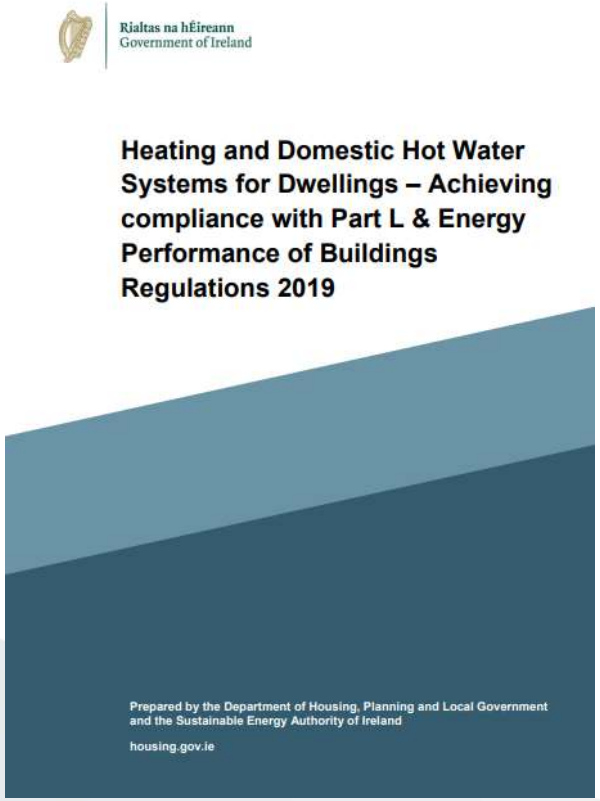
CONFORMITY WITH MAX AVG U-VALUE REQUIREMENTS

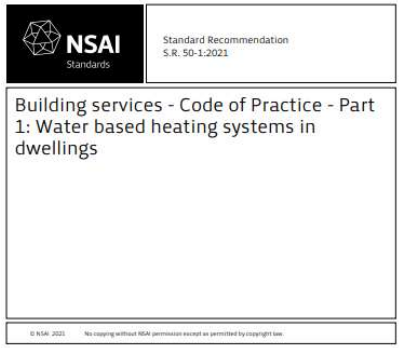
Avg elemental U-Values [W/m²K]	
Pitched roof insulated on slope	0.000
Pitched roof insulated on ceiling	0.130
Flat roof	0.000
Floors with no underfloor heat	0.180
Floors with underfloor heat	0.000
Walls	0.194
Percentage of opening areas [%]	15.575
Average U-value of openings	0.720
Meets Part L maximum avg U-value requirement for opaque elements using TGD L Section 1.3.2.3	

CONFORMITY WITH MAX U-VALUE REQUIREMENTS

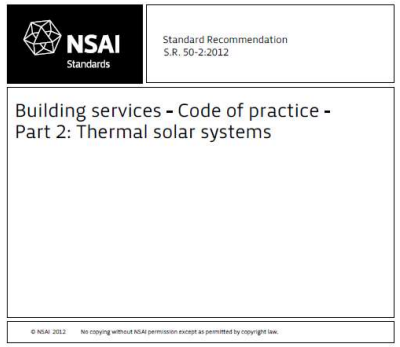
1.3.2.3 Reasonable provision would also be achieved if the total heat loss through all the opaque elements did not exceed that which would be the case if each of the area-weighted average U-value (Um) set out in Table 1 were achieved individually. Where this approach is chosen, the values for individual elements or sections of elements given in Table 1 (Column 3) also apply. For ground floors or exposed floors incorporating underfloor heating, the guidance in paragraph 1.3.2.2 applies.

Space heating and domestic hot water systems Installation and Commissioning certificates

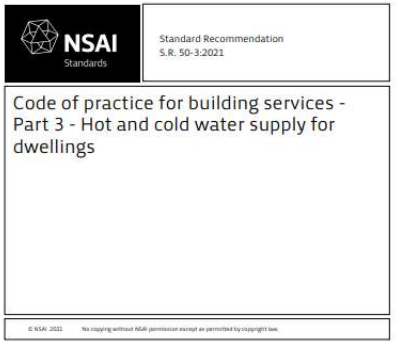




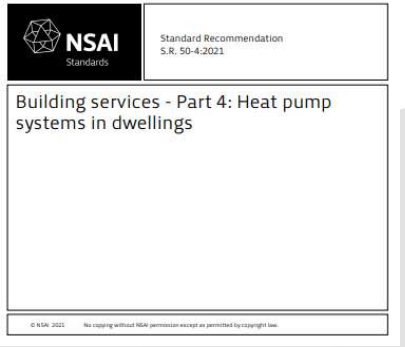
Clause 8, Annex E (E.5)



Clause 7



Clause 19, Annex C (C.3)



Annex H

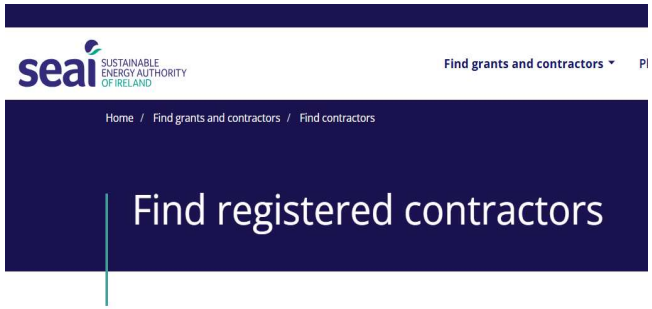
https://www.nsai.ie/about/news/s.r-50-series-standards-plumbing-and-heating/

Competent installers

CONSTRUCTION INDUSTRY FEDERATION

Construction Industry Register Ireland (CIRI)

1.2.9 To ensure that works are carried out in a "workmanlike manner", the design and installation of renewable energy systems to comply with this guidance should be carried out by a person qualified to carry out such work. A suitably qualified installer should have achieved Quality and Qualifications Ireland (QQI) or equivalent certification from an accredited training course in each of the technology areas they wish to work in. Qualified installers may include SEAI registered installers, Solas trained plumbers or Solas trained electricians, who have completed an appropriate renewable technology module, or similar.

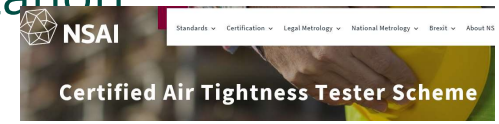


https://www.solas.ie/programmes/green-skills/

Air Tightness – TGD L 1.3.4

- Air pressure testing should be carried out on <u>all dwellings on all development sites</u> including single dwelling developments to show attainment of backstop value of 5 $m^3/(h.m^2)$.

- 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 Board (INAB), National Standards Authority of Ireland (NSAI) certified or equivalent.
  - Procedure for testing specified in I.S. EN 9972:2015 (under revision).
  - Two sets of measurements should be made for pressurization and depressurization.



- 102 registered. 4 accredited.

Bord Náisiúnta na hÉireann um Chreidiúnú
Irish National Accreditation Board

- AC should provide BCO (and home owner) with an Air Tightness Test Report with an Air Permeability not greater than 5 $m^3/hr.m^2$ for all new NZEB dwellings. The Air Permeability measured should be in line with the selected Ventilation strategy.

TGD F 2019

- **TGD F 2019 ventilation systems application range:**

Ventilation System	Air Permeability range: 3-5 $m^3/h.m^2$	Air Permeability range: Less than 3 $m^3/h.m^2$
CMEV	✓	✓
MVHR	✓	✓
Natural Ventilation with intermittent extract ventilation	✓	✗

- **1.2.4.1: Natural Ventilation:**

Where the intended design is greater than 3 $m^3/h.m^2$ and the actual construction achieves a lower value, then appropriate additional measures should be implemented to ensure adequate ventilation.

CONSTRUCTION INDUSTRY FEDERATION

Construction Industry Register Ireland (CIRI)

TGD F 2019

1 Ventilation systems should be **designed by competent designers**. Systems should be
2 **installed, balanced and commissioned by competent installers** e.g. Quality and Qualifications Ireland accredited or Education Training Board or equivalent.

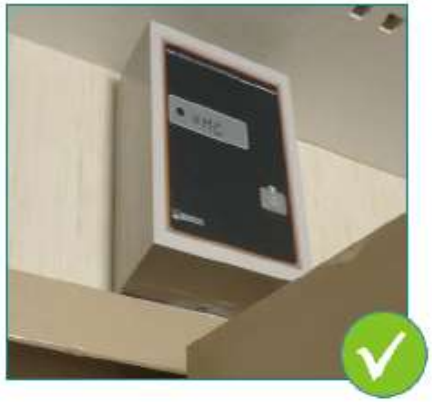
https://www.wwetb.ie/course/nearly-zero-energy-building-nzeb-ventilation-10/
https://mountlucas.ie/nzeb-ventilation/

3 **Systems, when commissioned and balanced, should then be validated by a independent competent person to ensure that they achieve the design flow rates.**
The validation should be carried out by a person certified by an independent third party to carry out this work, e.g. Irish National Accreditation Board (INAB), National Standards Authority of Ireland (NSAI) certified or equivalent. Detailed information on the installation and commissioning of ventilation systems is provided in *Installation and Commissioning of Ventilation Systems for Dwellings - Achieving Compliance with Part F.*

TGD F 2019

- **1.2.2.10 and 1.2.3.12: Control indicators**

Control indicators to be in a visible location to the occupant and not in a remote location such as in the attic or above the ceiling. Control indicators should indicate to the occupant that the system is operating correctly and if a fault has occurred.



- **1.2.2.12, 1.2.3.14 and 1.2.4.17: Information to homeowner**

The owner of the building should be provided with sufficient information about the ventilation systems and their maintenance so that an effective and an efficient ventilation system can be operated and maintained.

Installation and commissioning by competent installers (TGD F 2019 Paragraph 1.2.1.10)

Section 1: Introduction

This guide provides detailed guidance for persons installing fixed ventilation systems in new and existing dwellings to help them comply with installation and commissioning requirements of the Building Regulations.

This guide is referenced in Technical Guidance Document F. It provides installation guidance for ventilation systems as defined by Technical Guidance Document F.

It is important to note that the guide covers a range of frequently occurring situations but is not exhaustive and alternative means of achieving compliance with the ventilation requirements in the Building Regulations may be possible.

- **Tables 1/2: CMEV installation/commissioning requirements**
- **Tables 3/4: MVHR installation/commissioning requirements**
- **Tables 5/6: NV with intermittent extract fans installation/commissioning requirements**
- **Tables 7/8: PSV installation/commissioning requirements**
- **Section 6:**
  - *Part 3: commissioning report template*
  - *Part 4: validation report template*

Commissioning Reports Templates and Methodologies

CIBSE Commissioning Code A and *BESA Guide to Good Practice: Low Energy Ventilation for Residential Building*, both of which refer to *BSRIA Guide BG 49/2015: Commissioning air systems (Application Guide 3/89.1: The commissioning of air systems in buildings)* that includes some example Pro forma of reporting and documentation.

I.S. EN 14134:2019 Ventilation for buildings – Performance testing and installation checks of residential ventilation systems, of which the checks and measurement methods of the NSAI Ventilation Validation Registration Scheme broadly follows the guidance. The scope of this standards also states that it can be applied to commissioning of new systems.

NSAI Agrément Certification includes an agreed and assessed process of validation for alternative systems not illustrating prima facie compliance.

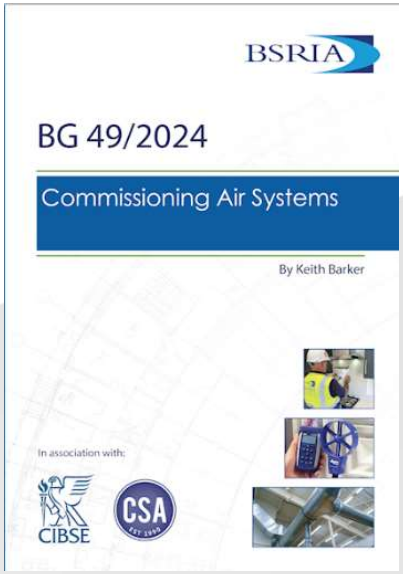

NSAI
Agrément

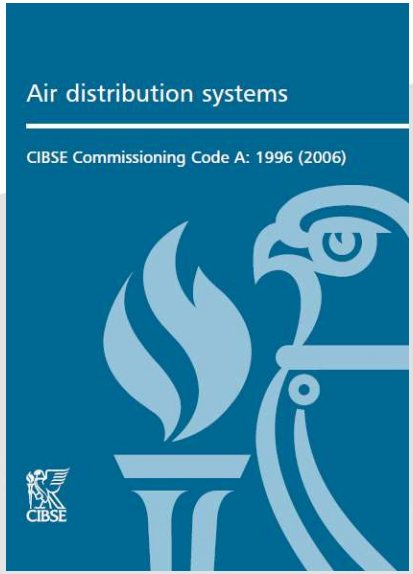
2.6 COMMISSIONING
2.6.1 General
Commissioning shall only be carried out by competent persons, as defined in TGD to Part F Clause 1.2.1.10, with suitable training and practical experience to commission the system. The use of a low-pressure manometer capable of recording between 0-200Pa is required. This certificate only applies to systems commissioned and registered using the Aereco commissioning certificate available through the Aereco website.


NSAI
Standards

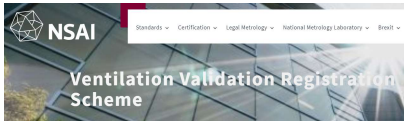
Irish Standard
I.S. EN 14134:2019

Ventilation for buildings - Performance measurement and checks for residential ventilation systems





Ventilation Validation Registration Scheme

- 61 registered 

3 accredited Bord Náisiúnta na hÉireann um Chreidiúnú
Irish National Accreditation Board

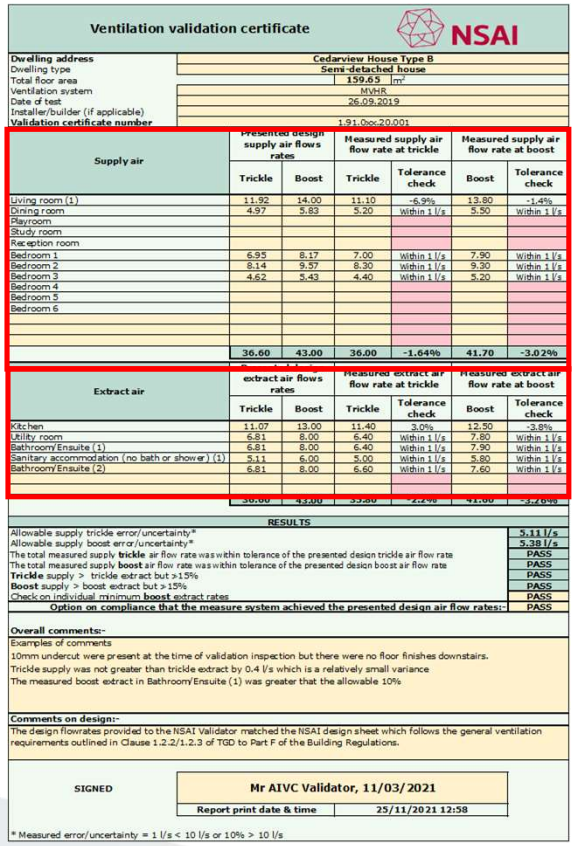
- On arrival to a site, the Ventilation validator shall be presented with a **ventilation design, air tightness certificate** and installers **commissioning report**.

- The Ventilation validator will assess that the presented design flow rates will satisfy the minimum provisions in TGD F 2019.
- They shall then proceed to take measurements to establish that the commissioned system complies with the satisfactory presented design, i.e. achieves the design flow rates (I.S. EN 14134:2019 Ventilation for buildings – Performance testing and installation checks of residential ventilation systems).

The Ventilation validator issues a mandatory Ventilation Validation Certificate.

Ventilation Validation Registration Scheme

VENTILATION VALIDATION CERTIFICATE TO BE PROVIDED TO BUILDING CONTROL



Ventilation validation certificate — NSAI

Dwelling address	Cedarview House Type B
Dwelling type	Semi-detached house
Total floor area	159.65 m²
Ventilation system	MVHR
Date of test	26.09.2019
Installer/builder (if applicable)	
Validation certificate number	1.91.0xx.20.001

Supply air	Presented design supply air flows rates		Measured supply air flow rate at trickle		Measured supply air flow rate at boost	
	Trickle	Boost	Trickle	Tolerance check	Boost	Tolerance check
Living room (1)	11.92	14.00	11.10	-6.9%	13.80	-1.4%
Dining room	4.97	5.83	5.20	Within 1 l/s	5.50	Within 1 l/s
Playroom						
Study room						
Reception room						
Bedroom 1	6.95	8.17	7.00	Within 1 l/s	7.90	Within 1 l/s
Bedroom 2	8.14	9.57	8.30	Within 1 l/s	9.30	Within 1 l/s
Bedroom 3	4.62	5.43	4.40	Within 1 l/s	5.20	Within 1 l/s
Bedroom 4						
Bedroom 5						
Bedroom 6						
	36.60	43.00	36.00	-1.64%	41.70	-3.02%

Extract air	Presented design extract air flows rates		Measured extract air flow rate at trickle		Measured extract air flow rate at boost	
	Trickle	Boost	Trickle	Tolerance check	Boost	Tolerance check
Kitchen	11.07	13.00	11.40	3.0%	12.50	-3.8%
Utility room	6.81	8.00	6.40	Within 1 l/s	7.80	Within 1 l/s
Bathroom/Ensuite (1)	6.81	8.00	6.40	Within 1 l/s	7.90	Within 1 l/s
Sanitary accommodation (no bath or shower) (1)	5.11	6.00	5.00	Within 1 l/s	5.80	Within 1 l/s
Bathroom/Ensuite (2)	6.81	8.00	6.60	Within 1 l/s	7.60	Within 1 l/s
	36.60	43.00	35.80	-2.2%	41.60	-3.26%

RESULTS	
Allowable supply trickle error/uncertainty*	5.11 l/s
Allowable supply boost error/uncertainty*	5.38 l/s
The total measured supply **trickle** air flow rate was within tolerance of the presented design trickle air flow rate	PASS
The total measured supply **boost** air flow rate was within tolerance of the presented design boost air flow rate	PASS
Trickle supply > trickle extract but >15%	PASS
Boost supply > boost extract but >15%	PASS
Check on individual minimum **boost** extract rates	PASS
Option on compliance that the measure system achieved the presented design air flow rates:-	PASS

Overall comments:-

Examples of comments

10mm undercut were present at the time of validation inspection but there were no floor finishes downstairs.

Trickle supply was not greater than trickle extract by 0.4 l/s which is a relatively small variance

The measured boost extract in Bathroom/Ensuite (1) was greater that the allowable 10%

Comments on design:-

The design flowrates provided to the NSAI Validator matched the NSAI design sheet which follows the general ventilation requirements outlined in Clause 1.2.2/1.2.3 of TGD to Part F of the Building Regulations.

SIGNED Mr AIVC Validator, 11/03/2021

Report print date & time 25/11/2021 12:58

* Measured error/uncertainty = 1 l/s < 10 l/s or 10% > 10 l/s

Achieves the design flow rates + Comments

TGD L 2022 – User Information

1.5.4.5 Air pressurisation test reports should be retained by the developer of the dwelling as proof of performance, and copies included in the user information referred to in Section 1.6.

1.6 USER INFORMATION

1.6.1 The owner of the building should be provided with sufficient information about the building, the fixed building services and their maintenance requirements so that the building can be operated in such a manner as to use no more fuel and energy than is reasonable in the circumstances. A way of complying would be to provide a suitable set of operating and maintenance instructions aimed at achieving economy in the use of fuel and energy in a way that householders can understand. The instructions should be directly related to the particular system(s) installed in the dwelling. Without prejudice to the need to comply with health and safety requirements, the instructions should explain to the occupier of the dwelling how to operate the system(s) efficiently. This should include:

(a) the making of adjustments to the timing and temperature control settings;

(b) what routine maintenance is needed to enable operating efficiency to be maintained at a reasonable level through the service life(lives) of the system(s); and

(c) the operation and maintenance of renewable energy systems.

TGD F 2019 – User Information

The owner of the dwelling should be provided with sufficient information about the ventilation strategy so that it can be operated in an effective manner. A way of complying would be to provide **a suitable set of operating and maintenance instructions in a way the householder can understand**. The instructions should **be directly related to the installation in the dwelling** without prejudice to the need to comply with health and safety regulations.

TGD F 1.2.2.12, 1.2.3.14 and 1.2.4.17.

health and safety regulations. The instructions should explain the important function of the system to provide adequate ventilation, how the system is intended to work, why the system should not be turned off, how the controls should be used and how and when the system should be cleaned and maintained. The location of the continuous centralized mechanical ventilation unit in the dwelling and the location of filters on the unit should be identified in the document.

Boost and normal operation of the unit should be explained and the effects of opening windows. Guidance on the operation of controls and how a fault is indicated, location of fault alarms and their meaning should also be included.

and safety regulations. The instructions should explain the important function of the system to provide adequate ventilation, how the system is intended to work, why the system should not be turned off, how the controls should be used and how and when the system should be cleaned and maintained. Cleaning of filters should be clearly explained in this document. The location of the Mechanical Ventilation with Heat Recovery unit in the dwelling and the location of filters on the unit should be identified in the document. An explanation of how to remove the filters from the unit and clean them should be provided. The frequency of cleaning of filters should also be clearly stated in this document.

Boost and normal operation of the unit should be explained and the effects of opening windows. Guidance on the operation of controls and how a fault is indicated should also be included.

CONCLUSION

- Confirmation of the use of proper materials.
- Design, Installation and Commissioning Certificates.
- DEAP Part L Compliance report (as built).
- A valid Air Tightness Test Report for all new NZEB dwellings supporting the ventilation strategy selected.
- A valid Ventilation Validation Certificate from an independent competent person that the ventilation system *"achieves the design flow rates"*.
- User information pack.

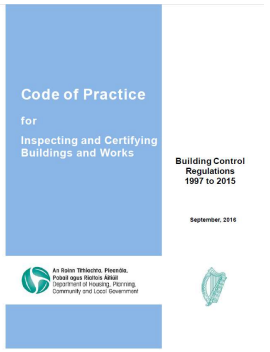


Table C.2 Typical documentation supporting compliance with Parts A to M for a Detached Non-Complex Dwelling House

Typical documentation (where applicable)	Builder to obtain and make available ✓	Assigned Certifier Check ✓
1. Confirmation of the use of proper materials.	See Table C.3 ✓	See Table C.3 ✓
2. Mechanical ventilation & heat recovery installation & commissioning report.	✓	✓
3. Waste water treatment system installation & commissioning report.		
4. Space & water heating system installation & commissioning report.	✓	✓
5. Air tightness test report.	✓	✓
6. DEAP calculation for dwelling house (as built).	✓	✓
7. Evidence of Fire detection/ alarm commissioning		
8. Other • NSAI Ventilation Validation Certificate • User Information Pack	✓ ✓	✓ ✓

What next?

- **2024 recast EPBD to be transposed by 29th May 2026:**
  - ***All new buildings shall be Zero Emissions Buildings by 1st January 2030***
  - ***Requirements for the implementation of adequate Indoor Environmental Quality standards in buildings in order to maintain a healthy indoor climate.***

Further information and CPD webinars available

- **NBC&MSO Resources:**
  NBC&MSO (20220505) Part L & Part F CPD Day

- **SEAI Resources:**
  Part L Compliance and Advisory Report results in DEAP
  BER Documentary Evidence

Rialtas na hÉireann
Government of Ireland

To follow:
SMcG - Thermal Bridging, ACDs

Climate and Construction Innovation Unit
Department of Housing, Local Government and Heritage

Rialtas na hÉireann
Government of Ireland

Building Regulations Compliance for Thermal Bridging

Simon McGuinness, Climate Action and Construction Innovation Section,
Department of Housing, Local Government and Heritage

Aims of the guidance

1) **Avoid excess heat loss due to thermal bridging**
2) **Avoid surface condensation risk through critical surface temperature calculation** (“ fRsi ”)

1 Requirements for New Dwellings

Building Regulations

Part L of the Second Schedule to the Building Regulations - **Regulation L1**

A building shall be designed and constructed so as to ensure that the energy performance of the building is such as to limit

the amount of energy required for the operation of the building and

the amount of carbon dioxide (CO2) emissions associated with this energy use

insofar as is reasonably practicable.

2

Technical Guidance Document L

TGD L guidance on Thermal Bridging

TGD L – Paragraph 1.3.3.1

To avoid **excessive heat losses** and local **condensation** problems, reasonable care should be taken to ensure

- continuity of insulation and
- to limit local thermal bridging at key junctions, e.g. around windows, doors, other wall openings and at junctions between elements.

Any thermal bridge should not pose a risk of surface or interstitial condensation.

—**Appendix D.2** provides further information on assessing surface condensation risk and

—**Appendix B.3** provides information on assessing interstitial condensation risk.

Reasonable Provision for Thermal Bridging

TGD L – Paragraph 1.3.3.2 and 1.3.3.3 (summary)

Para. 1.3.3.2	Reasonable provision alternatives	Value of y ("y-value" or "Y-factor")
(i)	Adopt **Acceptable** Construction Details for all key junctions	**0.08** *or* Calculated using the psi values given in Tables D1 to D6 in Appendix D
(ii)	Adopt Acceptable Construction Details in combination with other **certified** details for all key junctions	Calculated using the psi values given in Tables D1 to D6 in Appendix D and other certified Psi values
(iii)	Use certified details for all key junctions	Calculated using certified Psi values for the specific details adopted
(iv)	Use **alternative** details which limit the risk of mould growth and surface condensation to an acceptable level as set out in paragraph D.2 of Appendix D for all junctions	**0.15** *

Aims of the guidance

1) Avoid excess heat loss due to thermal bridging
2) Avoid surface condensation risk through critical surface temperature calculation (“ fRsi ”)

Reasonable Provision for Thermal Bridging

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Reasonable Provision for Thermal Bridging

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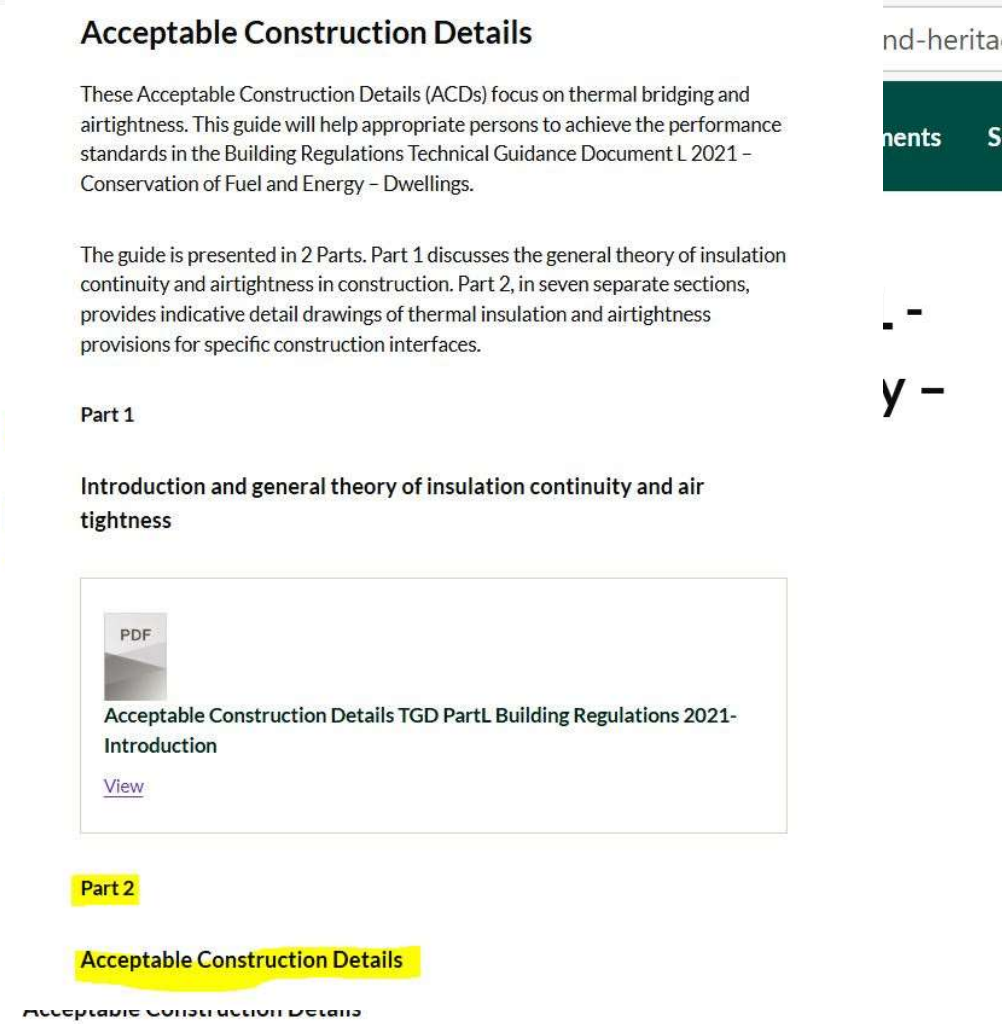
(iv)	Use **alternative** details which limit the risk of mould growth and surface condensation to an acceptable level as set out in paragraph D.2 of Appendix D for all junctions	**0.15 +fRsi**

3 Supplementary Guidance

Supplementary Guidance

How to find the supplementary guidance to Part L

Search “TGD L”

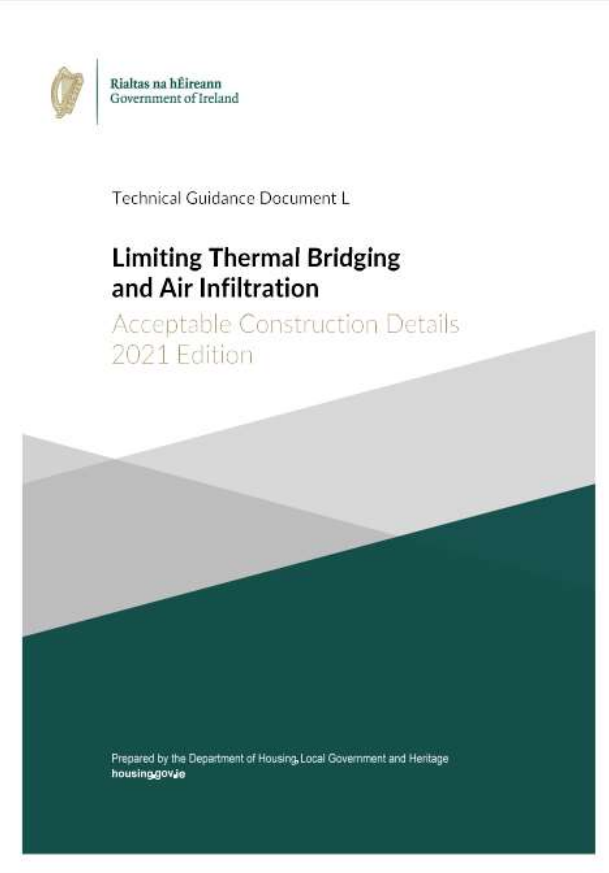


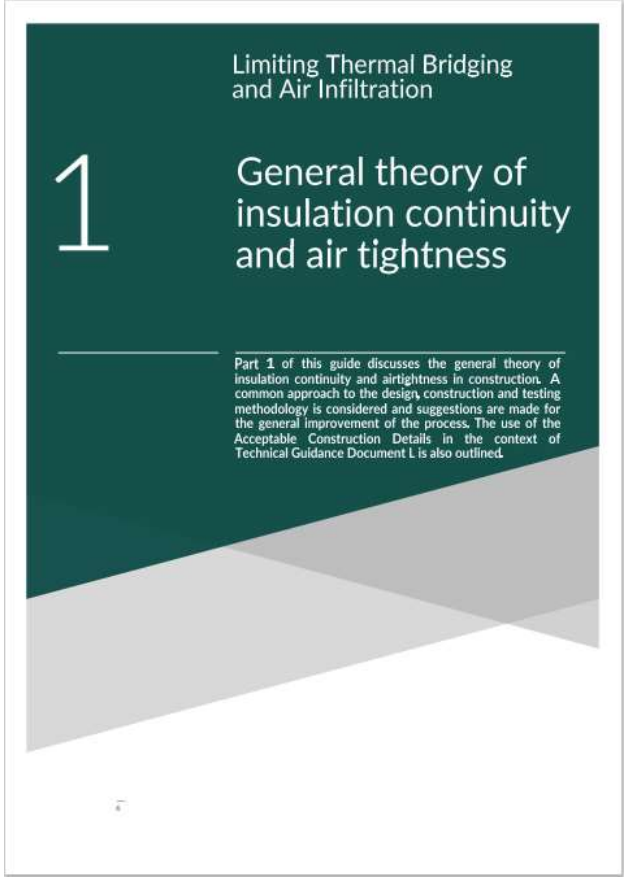
Supplementary Guidance

Limiting Thermal Bridging and Air Infiltration

Part 1 discusses the general theory of insulation continuity and airtightness in construction.

Proposes a common approach to the design, construction and testing methodology and Makes suggestions for the general improvement of the construction process





Part 1: General theory of Limiting Thermal Bridging and Air Infiltration

Limiting Thermal Bridging and Air Infiltration

1

General theory of insulation continuity and air tightness

Part 1 of this guide discusses the general theory of insulation continuity and airtightness in construction. A common approach to the design, construction and testing methodology is considered and suggestions are made for the general improvement of the process. The use of the Acceptable Construction Details in the context of Technical Guidance Document L is also outlined.

Figure 6: Foil-faced insulation board sealed to joists providing an effective VCL, airtightness barrier and insulation continuity through the intermediate floor void

Figure 7: Wet plaster scratch coat forms a continuous air barrier through the intermediate floor zone, joists penetrations sealed with appropriate tape

If the insulation is on the inner face of the external wall, thermal continuity requires greater attention to detail. There is a potential cold bridge all along the zone of the suspended floor. Continue the wall insulation through the intermediate floor zone and seal any vapour control layer, where present, to the joist penetrations.

THERMAL CONTINUITY WITH CONCRETE INTERMEDIATE FLOORS

As with timber floors, if the thermal insulation is in the cavity or is the external type, thermal continuity at the junction of the intermediate floor and the outside wall is achieved readily.

If the insulation is on the inner face of the external wall, thermal continuity is not possible.

AIRTIGHTNESS WITH INTERMEDIATE FLOORS

Airtightness at intermediate floors is a matter of extending the wall air barriers above and below the floor through the intermediate floor zone and taping up any penetrations of the air barrier by joist, joist hangers, beams, services etc. Where the intermediate floor is mass concrete this may form part of the airtight layer.

In timber floors, where joists are built into the inner leaf, airtightness is achieved by plastering the wall around the joists and taping the face of the joist to the plaster finish, see Figure 8. Alternatively, proprietary airtight caps are available for building in. Where joist hangers are used, it is recommended that these be installed on a layer of airtight membrane which is plastered over.

With timber frame or with dry-lined masonry, carry the airtight membrane or plasterboards through the floor zone and tape around the joists.

For good thermal performance:-

- Use separate lintels and insulate between them.
- Fill all gaps around and between lintels with tightly packed insulation. Overlap the frame and this insulation by at least 15 mm.
- Secure any partial fill insulation firmly against the inner leaf.
- Cut cavity insulation to suit. Sheets should be tightly butted to each other and surrounding cavity closers and loose fill insulation.

Figure 8: Certified proprietary airtightness reveal tapes are available for use with wet plaster air barriers

AIRTIGHTNESS AT WINDOW AND EXTERNAL DOOR OPES

Air leakage often occurs between window or door frames and the surrounding construction. Appropriate airtightness sealants are required between plaster finishes, window boards and frames. Approved airtightness sealants and tapes are available to assist the formation of air barrier continuity at such interfaces.

For air barrier continuity:

- Apply a third party certified tape or sealant at all interfaces between the internal air barrier and the window or door frame
- If forming the air barrier to the walls with a plaster scratch coat on blockwork, install an appropriate airtightness tape. Where this tape is plastered over, the tape should provide a suitable key for the plaster.

To qualify for the NSAI Window Energy Performance (WEP) Scheme, manufacturers must first demonstrate that their window and door arrangements achieve a Class 4 airtightness rating when tested at 600 Pa to I.S. EN 12207:1999 Windows and doors - Air permeability - Classification. As a result, well-made windows should have little or no air leakage. The lower the air leakage value of the window assembly, the greater will be the overall efficiency of the window assembly.

(8) External Door Thresholds

THERMAL CONTINUITY

Achieving sufficient thermal continuity to minimise the thermal bridge at door thresholds and to meet the critical surface temperature factor, fRsi, requires careful design.

Supplementary Guidance

Limiting Thermal Bridging and Air Infiltration

Part 2

Section 1: Cavity insulation
https://assets.gov.ie/201047/fb140abf-dc10-4262-8eb1-da4e79bc237f.pdf

Section 2: External insulation
https://assets.gov.ie/201048/8a35795a-0876-4877-b5d6-2166238ce84b.pdf

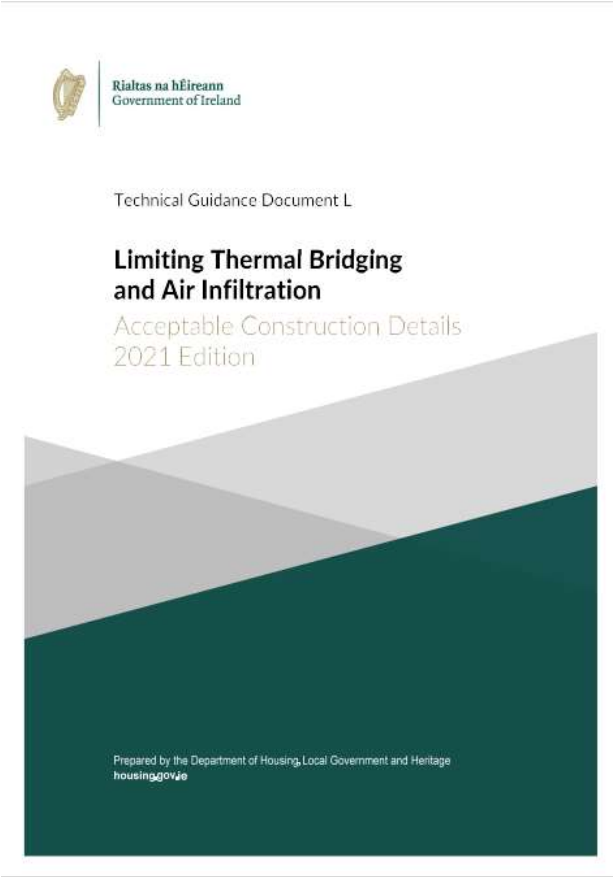
Section 3: Internal insulation
https://assets.gov.ie/201050/1ecf69d3-8e37-49b7-8d53-b39dceb717d1.pdf

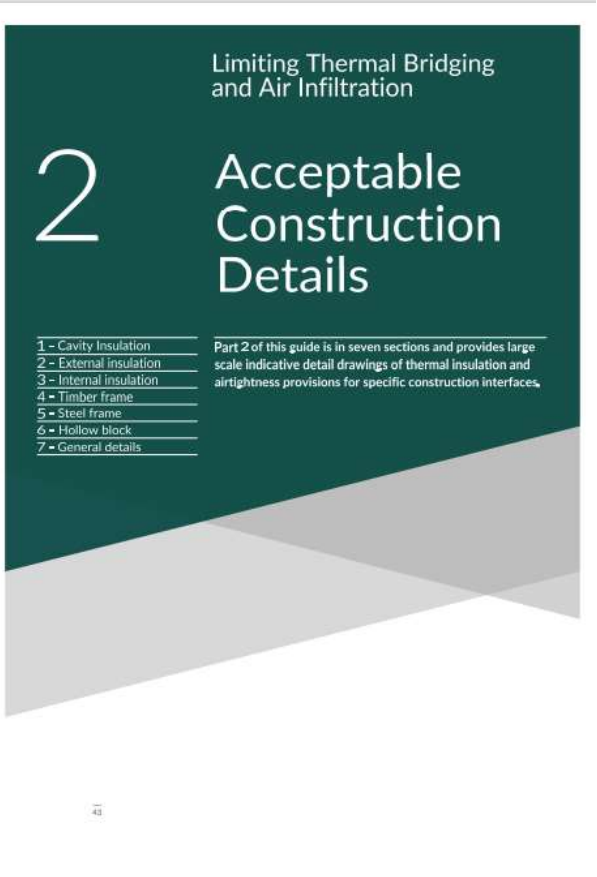
Section 4: Timber Frame
https://assets.gov.ie/201052/293075e1-3661-4085-816f-50d69cdc7f73.pdf

Section 5: Steel Frame
https://assets.gov.ie/201056/69791323-09a5-4f69-b741-61cc1ec4c8b5.pdf

Section 6: Hollow Block Internal Insulation
https://assets.gov.ie/201057/b7b9b481-f19f-4c91-b855-7223eec1f877.pdf

Section G: General
https://assets.gov.ie/201046/9e88e894-26f0-4bd3-b435-401ec43c9be5.pdf





Supplementary Guidance

Limiting Thermal Bridging and Air Infiltration

Part 2

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Section G: General
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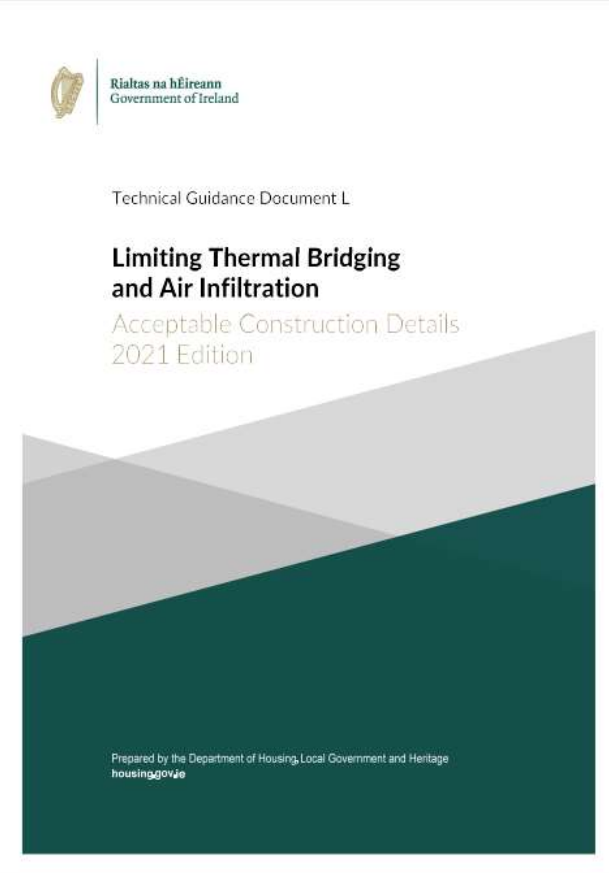
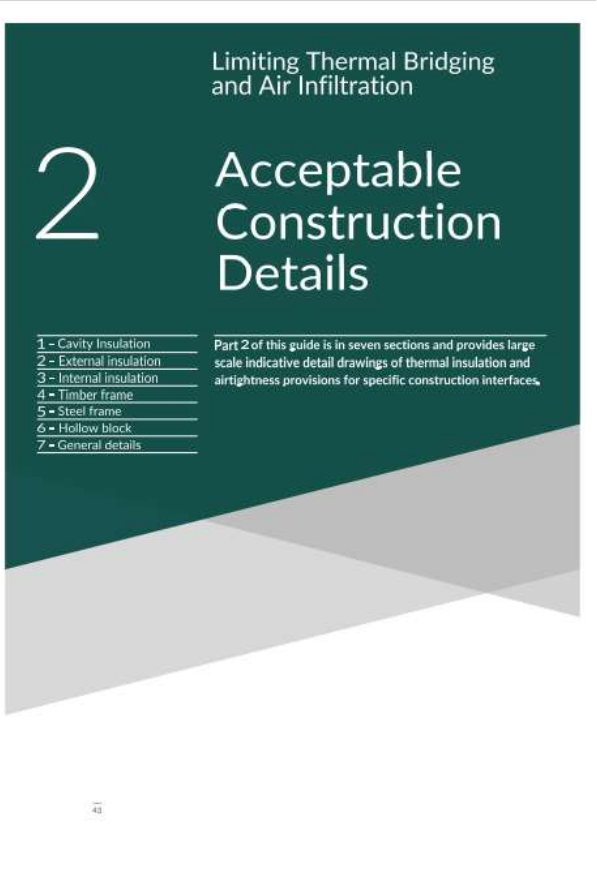


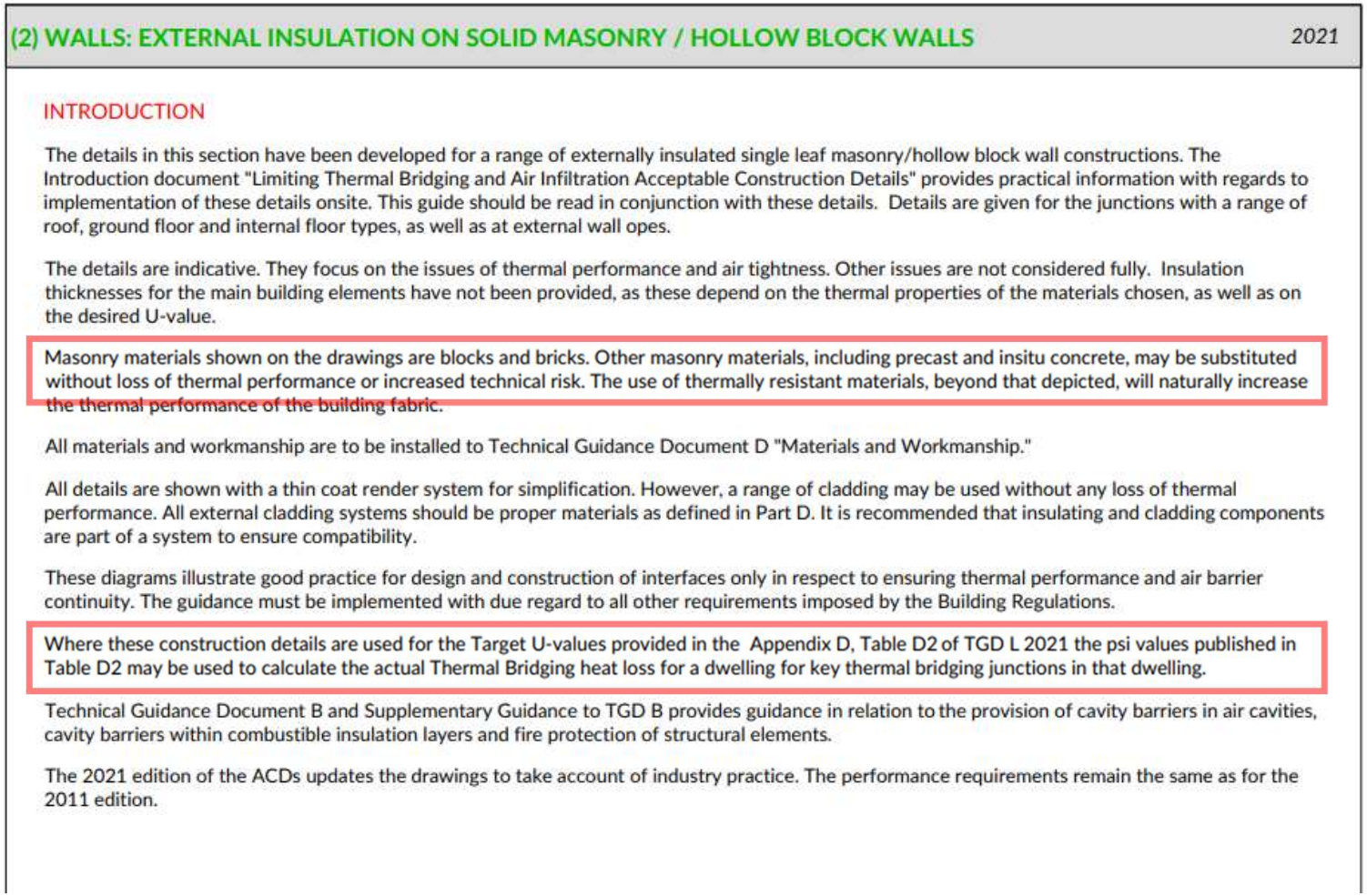


Supplementary Guidance - Read the introduction!

ACDs for Major Renovation?

The masonry material shown on the drawings are bricks and blocks. Other masonry materials, including precast and insitu concrete, may be substituted without loss of thermal performance or increased technical risk.

Where these construction details are used, the Appendix D, Table D2 of TGD L 2021 the psi-values published in Table D2 may be used.



(2) WALLS: EXTERNAL INSULATION ON SOLID MASONRY / HOLLOW BLOCK WALLS 2021

INTRODUCTION

The details in this section have been developed for a range of externally insulated single leaf masonry/hollow block wall constructions. The Introduction document "Limiting Thermal Bridging and Air Infiltration Acceptable Construction Details" provides practical information with regards to implementation of these details onsite. This guide should be read in conjunction with these details. Details are given for the junctions with a range of roof, ground floor and internal floor types, as well as at external wall opes.

The details are indicative. They focus on the issues of thermal performance and air tightness. Other issues are not considered fully. Insulation thicknesses for the main building elements have not been provided, as these depend on the thermal properties of the materials chosen, as well as on the desired U-value.

Masonry materials shown on the drawings are blocks and bricks. Other masonry materials, including precast and insitu concrete, may be substituted without loss of thermal performance or increased technical risk. The use of thermally resistant materials, beyond that depicted, will naturally increase the thermal performance of the building fabric.

All materials and workmanship are to be installed to Technical Guidance Document D "Materials and Workmanship."

All details are shown with a thin coat render system for simplification. However, a range of cladding may be used without any loss of thermal performance. All external cladding systems should be proper materials as defined in Part D. It is recommended that insulating and cladding components are part of a system to ensure compatibility.

These diagrams illustrate good practice for design and construction of interfaces only in respect to ensuring thermal performance and air barrier continuity. The guidance must be implemented with due regard to all other requirements imposed by the Building Regulations.

Where these construction details are used for the Target U-values provided in the Appendix D, Table D2 of TGD L 2021 the psi values published in Table D2 may be used to calculate the actual Thermal Bridging heat loss for a dwelling for key thermal bridging junctions in that dwelling.

Technical Guidance Document B and Supplementary Guidance to TGD B provides guidance in relation to the provision of cavity barriers in air cavities, cavity barriers within combustible insulation layers and fire protection of structural elements.

The 2021 edition of the ACDs updates the drawings to take account of industry practice. The performance requirements remain the same as for the 2011 edition.

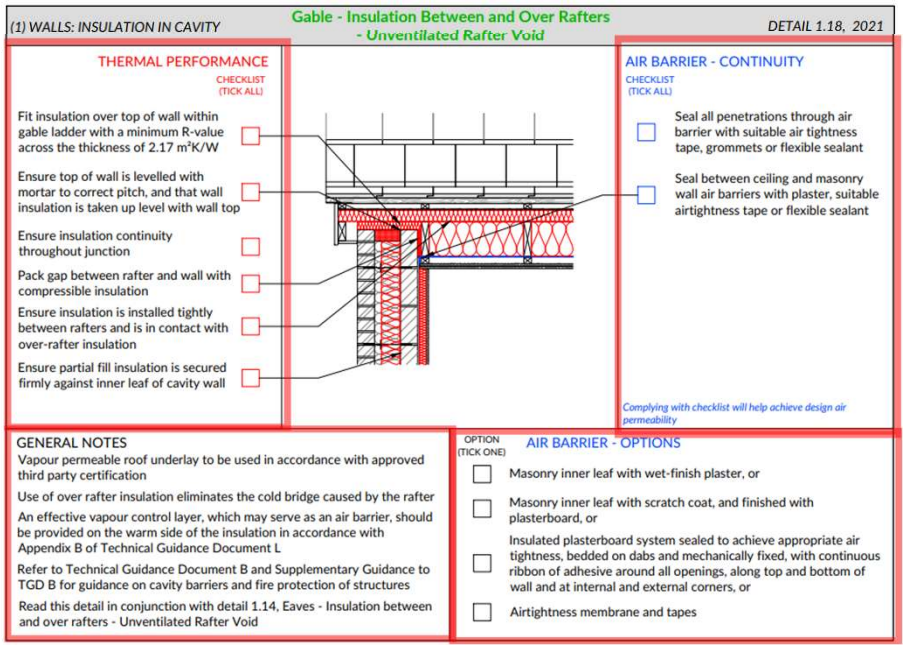
How the ACDs assist designers in compliance

These diagrams illustrate good practice for design and construction of interfaces only in respect to ensuring:

- *thermal performance*
- *air barrier continuity*
- *achievement of critical surface temperature (fRsi).*

The guidance must be implemented with due regard to all other requirements imposed by the Building Regulations.

Use of the ACDs during construction will enable the designer or builder to demonstrate that provision has been made to eliminate all reasonably avoidable thermal bridges in the insulation layers.



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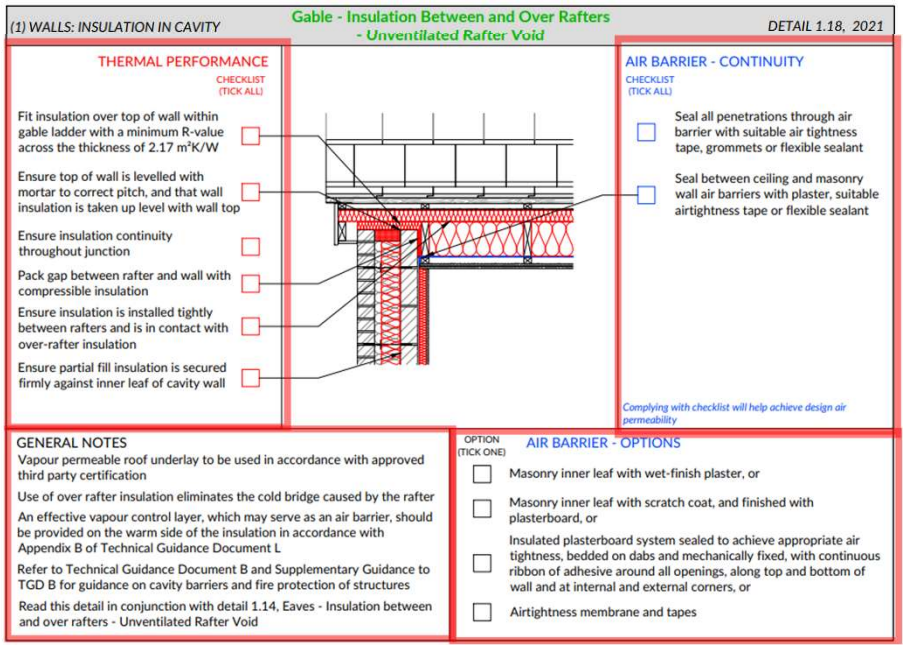


SEAI thermal bridging factor calculator

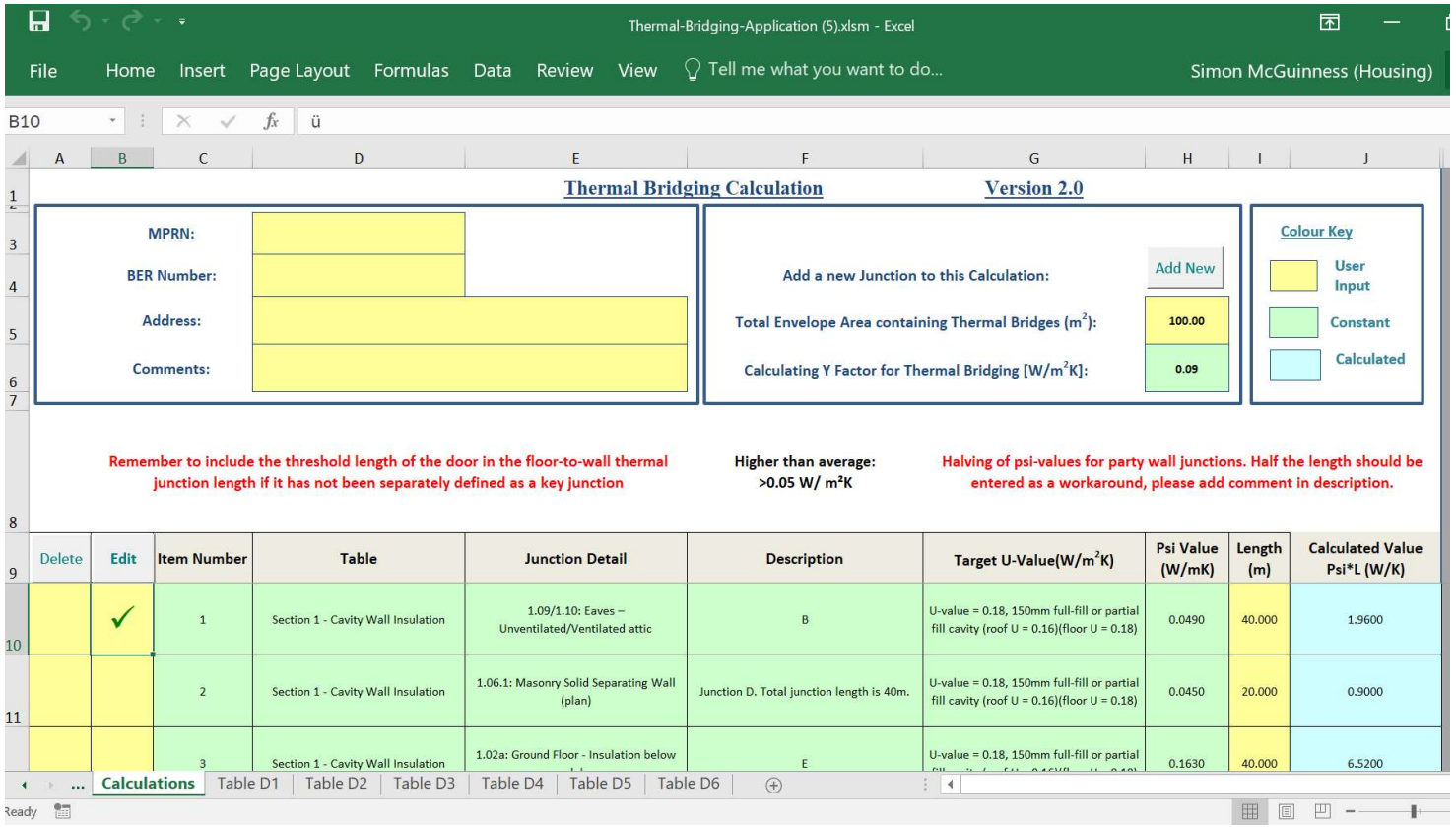
DEAP Thermal Bridging Factor Application
(updated Dec 2023)

Instructions:

https://www.seai.ie/sites/default/files/forms/Thermal-Bridging-Application-Instructions.pdf

Application:

https://www.seai.ie/sites/default/files/data-and-insights/Thermal-Bridging-Application.xlsm



Rialtas na hÉireann
Government of Ireland

Thank You

Simon McGuinness
buildingstandards@housing.gov.ie