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HPI QA 2.0 – Thermal Bridging – Evidential Guidance

All evidence requirements have been aligned with national methodology for BER assessment and compliance with building regulations TGD Part L. The Home Performance Index does not seek to ask for more evidence than what is already being asked for by SEAI, NSAI and BCAR.

Where the Home Performance Index differs is in setting higher performance benchmarks than building regulations, but these targets can still be shown with the same evidence requirements.

• Calculation of Y-Factor

<p><i>What aspects of the building needs to be examined:</i></p>	<p>All key junctions to be examined.</p> <ul style="list-style-type: none"> - SEAI BER technical bulletin July 2020 (https://www.seai.ie/publications/Domestic BER Technical Bulletin July 2020.pdf) gives guidance on what can be considered a key junction in section 1.5.
<p><i>What needs to be included in the evidence:</i></p>	<p>Complete evidence is aligned with Section 1.5.3 of SEAI BER technical bulletin July 2020 (https://www.seai.ie/publications/Domestic BER Technical Bulletin July 2020.pdf). It should include the following:</p> <ul style="list-style-type: none"> - Portfolio of plans and sections, identifying and labelling all key junctions in the project following the methodology as laid out in SEAI BER technical bulletin July 2020, section 1.6. - Detailed drawings of certified key junctions - ACD checklists of the relevant ACDs used. - Schedule of all junctions identified in the drawings. The schedule is to include all the items given in SEAI BER technical bulletin July 2020 Section 1.6(b). These include the following: A clear reference to the dwelling being assessed. A list of all of the junctions in the dwelling. All junctions must be included in this list. The relevant person, as defined in Section 1.5, may consider a particular junction not to be a key junction, e.g. a door threshold, but must still include this junction here and explicitly state that it is not a key junction. For each junction that is considered to be a key junction, the associated ACD or certified detail must be identified. - If required a report showing the thermal modelling of the certified junctions in order to calculate the psi value and fRsi-value for each junction. - A report showing the calculation of the y-factor of the dwelling.
<p><i>Who can compile and sign off on the evidence:</i></p>	<ul style="list-style-type: none"> - Portfolio of plans and sections, identifying and labelling all key junctions to be done by the designer (Project Architect). - Detail drawings of non-ACD key junctions and associated ACD checklists, these are to be signed by the relevant person confirming the junction was designed and built in accordance with the relevant junction. - Schedule of all junctions identified in the drawings to be done by the designer (Project Architect). - Report compiling the psi calculations and fRsi calculations for certified key junctions is to be signed by a registered NSAI Thermal Modeller



	<p>(https://www.nsai.ie/certification/agreement-certification/thermal-modellers-scheme/) who adheres to section 11.3 of NSAI’s approved Thermal Modellers Scheme guidance note when compiling their report (https://www.nsai.ie/images/uploads/certification-agreement/F-IAB-031_TM_Scheme_Guidance_notes_Rev_C.pdf).</p> <ul style="list-style-type: none"> - Report showing the calculation for the y-factor for each dwelling is to be signed by the BER assessor for the project.
<p><i>Additional guidance:</i></p>	<ul style="list-style-type: none"> - SEAI BER technical bulletin July 2020 (https://www.seai.ie/publications/Domestic_BER_Technical_Bulletin_July_2020.pdf) gives guidance on what can be considered a key junction in section 1.5. - Psi values for ACDs can be found in Tables D1 to D6 of TGD L (https://www.gov.ie/en/publication/d82ea-technical-guidance-document-l-conservation-of-fuel-and-energy-dwellings/) - It is extremely unlikely in the case of apartments that all key junctions are built in accordance with the ACDs, as ACDs do not cover a number of key junctions typically common to apartments (e.g. balconies, base details over unheated or commercial spaces, etc.). - Relevant person can be one of the following: Developer; Main Contractor; Lead architect; Lead Engineer or Assigned Certifier.

Alternative compliance:

Published BER dwelling report – showing bespoke calculated Y-factor will be accepted in lieu of above evidential requirements (defaults of 0.15 & 0.08 will not be accepted for alternative compliance). The reasoning for this alternate compliance is that the above information would still have to be compiled and given to the BER assessor for them to insert a bespoke Y-factor in the BER. As such it means that this information has been examined and approved by the BER assessor, who is subject to the SEAI auditing process. Clarification can still be sought by IGBC, if there is a belief that the Y-factor given in the dwelling report may be wrong due to human error in the inputting of the figure into the DEAP software. This clarification can be confirmation from the BER assessor that the figure is correct.

• Calculation of fRsi

<p><i>What aspects of the building needs to be examined:</i></p>	<p>All key junctions to be examined (see guidance on what can be considered key junctions).</p> <p>In the case of junctions that are designed and built to ACDs. These junctions do not need to be examined if fRsi benchmark being targeted for the HPI is 0.75.</p> <p>In cases where the benchmark is 0.8 and greater, key junctions that are designed and built to ACDs are to be examined and their corresponding fRsi calculated.</p>
<p><i>What needs to be included in the evidence:</i></p>	<ul style="list-style-type: none"> - Portfolio of plans and sections, identifying and labelling all key junctions in the project following the methodology as laid out in SEAI BER technical bulletin July 2020, section 1.6. - Detailed drawings of non-ACD key junctions - ACD checklists of the relevant ACDs used. - Schedule of all junctions identified in the drawings. The schedule is to include all the items given in SEAI BER technical bulletin July 2020 Section 1.6(b). These include the following: A clear reference to the dwelling being assessed. A list of all of the junctions in the dwelling. All junctions must be included in this list. The relevant person, as defined in Section 1.5, may consider a particular junction not to be a key junction, e.g. a door threshold, but must still include this junction here and explicitly state that it is not a key junction. For each junction that is considered to be a key junction, the associated ACD or certified detail must be identified. - A report showing the fRsi calculations for each identified junction following the calculation method as laid out in building regulations TDG L Dwellings 2022 Appendix D (https://www.gov.ie/en/publication/d82ea-technical-guidance-document-l-conservation-of-fuel-and-energy-dwellings/). The calculation procedure to establish temperature factor (fRsi) is outlined in BRE IP 1/06. Details should be assessed in accordance with the methods described in BR497:2016 & I.S. EN ISO 10211:2017. To be acceptable, numerical modelling software must be validated in accordance with the examples provided 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. Several packages are available that meet this requirement.
<p><i>Who can compile and sign off on the evidence:</i></p>	<ul style="list-style-type: none"> - Portfolio of plans and sections, identifying and labelling all key junctions to be done by the Project Architect. - Detail drawings of non-ACD key junctions and associated ACD checklists, these are to be signed by the relevant person confirming the junction was designed and built in accordance with the relevant junction. - Schedule of all junctions identified in the drawings to be done by the designer (Project Architect). - Report compiling the fRsi calculations for all applicable key junctions is to be signed by a registered NSAI Thermal Modeller (https://www.nsai.ie/certification/agreement-certification/thermal-modellers-scheme/).
<p><i>Additional guidance:</i></p>	<ul style="list-style-type: none"> - SEAI BER technical bulletin July 2020 gives guidance on what can be considered a key junction in section 1.5 (https://www.seai.ie/publications/Domestic_BER_Technical_Bulletin_July_2020.pdf) - Relevant person can be one of the following: Developer; Main Contractor; Lead architect; Lead Engineer or Assigned Certifier.



• Calculation of Heat Losses

<i>What needs to be included in the evidence:</i>	For Heat loss evidence, published BER dwelling reports and an excel document showing heat loss calculations is needed. IGBC will also develop a heat loss calculator template that can be used for the excel document (template to be made available by March 2024).
<i>Who can compile and sign off on the evidence:</i>	HPI assessor and/or BER assessor and/or member of the design team (Project Architect or Assigned Certifier) can develop and submit the excel document showing heat loss calculations.
<i>Additional guidance:</i>	Heat losses due to thermal bridging can be calculated from the following figures taken from the BER dwelling report:

Heat loss details

Total glazed area [m ²]	20.17	Glazing ratio	0.11
Total glazed heat loss [W/K]	24.92	Summer solar gain [W/m ²]	952.11
Total effective collection area [m ²]	7.35	Total element area [m ²]	150.55
Total plane heat loss [W/K]	51.98	Thermal bridging factor [W/m ² K]	0.1500
Fabric heat loss [W/K]	74.57		
Total heat loss [W/K]	78.61	Per m2	0.98

Lighting and Internal Gains

Lighting Design Calculation Method	Lighting	Average Efficacy [lm/W]	101.94
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- $((\text{Total Element area (m}^2) \times \text{thermal bridging factor (W/m}^2\text{K)}) / \text{total heat loss (W/K)}) \times 100 = \% \text{ heat loss due to thermal bridging.}$
- $((150.55 \times 0.15) \text{ W/K} / 78.61 \text{ W/K}) = 22.5825 / 78.61 = 0.2873 = 28.73\%$



- **Calculation of Hygrothermal performance**

<i>What aspects of the building needs to be examined:</i>	All wall, and/or floors and/or roof build ups as deemed necessary by the appointed qualified hygrothermal risk assessor on the project.
<i>What needs to be included in the evidence:</i>	Hygrothermal assessment report showing proposed wall build constructions and calculations demonstrating no hygrothermal risk in accordance with I.S. EN 15026:2023 as guidance for calculation method. Someone needs to sign or confirm that assessed details have been installed as designed. Confirmation by the assigned certifier that the details have been constructed in accordance with detailed design drawings is required, with a statement that site inspection reports and photographic supporting evidence is available.
<i>Who can compile and sign off on the evidence:</i>	- Qualified hygrothermal risk assessor.
<i>Additional guidance:</i>	<ul style="list-style-type: none"> - The appointed hygrothermal risk assessor must have an academic qualification in hygrothermal risk assessment using their chosen validated software package, and must have demonstrable prior experience in hygrothermal risk assessment of similar construction types from previous projects. The hygrothermal risk assessor shall select the construction walls, which are deemed necessary for hygrothermal risk assessment in accordance with IS EN ISO 15026:2023. A schedule of all wall types should be produced and cross-referenced to an Excel schedule of same, with a comment/statement by the hygrothermal risk assessor as to why any element does <i>not</i> require hygrothermal risk assessment. - BS 5250:2021 Management of moisture in buildings – Code of practice can be used for additional guidance.