

Energy Standards Review – Scottish Building Regulations

Working group meeting 3 – 13:00 – 16:00, 13 April 2021

Note of meeting

Attendance:

[REDACTED]	(Chair)	Construction Scotland Innovation Centre
[REDACTED]		Federation of Master Builders
[REDACTED]		Royal Incorporation of Architects Scotland
[REDACTED]		Scottish Renewables
[REDACTED]		Heating and Hot Water Industry Council
[REDACTED]		Industrial and Commercial Energy Association (second half)
[REDACTED]		Local Authority Building Standards Scotland
[REDACTED]		Strathclyde University
[REDACTED]		Strathclyde University
[REDACTED]		Chartered Institute of Architectural Technologists
[REDACTED]		Chartered Institution of Building Services Engineers
[REDACTED]		Homes for Scotland
[REDACTED]		Royal Institution of Chartered Surveyors
[REDACTED]		Scottish Federation of Housing Associations
[REDACTED]		The Wheatley Group
[REDACTED]		Construction Scotland
[REDACTED]		Scottish Futures Trust
[REDACTED]		SG Building Standards Division
[REDACTED]		SG Building Standards Division
[REDACTED]		SG Building Standards Division
[REDACTED]		SG Building Standards Division
[REDACTED]		SG Building Standards Division

Apologies:

[REDACTED]	BRE Scotland (S6 Scheme Provider)
[REDACTED]	Scottish Property Federation

Item

1. Introduction

- 1.1 The chair thanked everyone for joining the 4th meeting and welcomed the new members – [REDACTED] from RICS and [REDACTED] from BSD who then introduced themselves. The chair requested officials recirculate the updated WG biographies document.

Action 1: BSD to re-circulate biographies

2. Note of WG3 and actions

- 2.1 The members confirmed the note of the Third meeting, WG 19 (21), was an accurate record of the meeting.

- 2.2 In response to Actions 1 & 2 from previous meeting, an Actions Log and Risk Register are now presented, papers WG 20 (21) & WG 21 (21). Four action points are closed, 10 remain open. BSD noted investigations still ongoing on digital platform; response to biofuels question will be circulated next week. The risk register notes uncertainties around development timescale of the NCM (2 issues) and a potential surge in building warrant applications. Further comment on both documents are welcomed from WG members.

Action 2: WG feedback on both actions log and risk register welcome.

- 2.3 The chair noted that the substantive part of the meeting is discussion on proposals for fabric, existing buildings and services, referring to papers WG 1, 18 & 22. The chair invited BSD to introduce paper WG 22 (21) to the working group.

3. Fabric backstops for new buildings - WG 22 (21)

- 3.1 BSD noted this as one of two remaining topics for the WG to consider following on from discussion on revisions to the NB specifications for new buildings (the other being treatment of on-site generation). An outline was given of the current elemental approach (e.g. elemental, per clause 6.2.1 guidance), noting backstops are generally improved each time overall emissions targets are reviewed under standard 6.1.
- 3.2 Discussion sought on two main topics - the level at which elemental backstops are set for D & ND buildings and the need to introduce a further heat demand metric for new homes. BSD corrected a statement in paper 22 - only England currently has or proposes a Target Fabric Energy Efficiency Rating ('TFEE'), not Wales. Discussion began on **Domestic proposals**.
- 3.3 It was noted that TFEE was introduced as one method of driving delivery of a suitably challenging level of fabric. It defines elemental specification that varies from NB or backstops and enables calculation of space heating demand via the methodology (e.g. SAP box 99). Is such a metric needed if we have robust backstops for U-values, which drive the nature of solutions, e.g. multi-layer insulation which also supports lower infiltration and thermal bridging. Is an elemental approach sufficient to deliver intended outcome.
- 3.4 BSD also asked for views on:
- whether there was a need for backstop values for infiltration and non-repeating thermal bridging or if these are addressed as a function of broader insulation specification.
 - should a single set of backstops be defined for both consultation options or should they be set relative to the values cited for the notional building
- 3.5 Initial discussion revisited the potential to address building geometry to encourage a more energy efficient form. Brief discussion on pros and cons. Following earlier discussions, officials noted that it remained the proposal that a 'form factor' would not be investigated and that the notional building would

generate a relative target based upon the current 'notional form = actual form' approach (with minor limitations such as maximum glazed area in NB).

- 3.6 WG noted that the second consultation in England proposed maintaining TFEE for new homes at either full specification or with a 15% relaxation factor. Suggestion that some typologies may struggle to comply. BSD noted that TFEE was also a relative target, being based on actual form.
- 3.7 Suggestion that wall U-values below 0.18 become more specialised, with changes to elements such as stud sizes and practicalities of implementation. May also increase embodied carbon associated with solutions due to greater reliance on rigid foam insulation. Solutions offer diminishing return.

BSD noted that EPC data reports that the values proposed are achieved at present in more than 50% of new homes (noting value for walls is based upon flats, not houses – where there is less reliance on PV to offset dwelling emissions).

BSD noted that measurement of embodied emissions is not a topic for the 2021 or 2024 review currently, though there is a broader discussion on how sustainable development can be better supported across government policy areas, including lifecycle/embodied emissions from construction.

- 3.8 During discussion, other comments made included:
- Useful to understand in more detail actual U-values being delivered across dwelling types. Suggest we include the information on analysis of EPC data for new homes as an addendum to the consultation proposals once issued. It was suggested that it would also be useful to add the percentile values to the table. BSD agree.
 - Is there a need to still differentiate in U-values for 'insulation at rafter' and 'insulation at tie' roofs?
 - Common loft spec of 400mm quilt but above that, becomes more challenging and therefore a move to more carbon intensive solutions is likely e.g. rigid foam insulation.
 - TFEE approach includes information from the SAP calculation on the building form such as beneficial solar gain.
 - Should g-value for glazing not be specified? [\[post meeting note – it is, see table 4.5a in paper WG 07\]](#)
 - Is it the intent to consult on both options of U-values [\[post meeting note – yes both the improved and advance options will be consulted on\]](#)
 - Is there a limiter applied to infiltration below a certain value to avoid seeking benefit without suitable ventilation spec (BSD noted intent to follow England and limit credit to 3m³ unless supply/extract ventilation present).
- 3.9 On the proposal to consider a new fabric metric:

- Merit in 'box 99' approach where the value of the actual building must not be greater than the NB value – however there was concern that this may drive MVHR solutions as there is a benefit realised compared to other ventilation solutions?
- Need to preserve flexibility of design or approach. Avoid dictating values that prevent useful, practical solutions.
- Remember that backstops are intended to dictate limits on solution given the desire to increase performance?
- Important to also recognise other elements of building specification which reduce energy needed to meet heat demand. Where does the balance of solutions lie?
- WG noted it would be useful to have an illustration within any consultation version of SAP – e.g. enable a TFE calculation (box 99) using the same values proposed as elemental backstops.

3.10 Specifically for **new non-domestic buildings**, it was noted that there is less data from EPC completions to assist in determination of suitable backstop values. And some use of more challenging values already occurs for shell buildings since 2015. There is no parallel imperative to focus so specifically on reducing heat demand but this is still recommended.

3.11 On the proposals in general:

- Backstops are more relaxed for ND buildings than for D, reflecting the wider range of construction solutions typically employed across a wide range of building types.
- Noting also that the NB specifications proposed by our research contractor are based upon solutions that are generally deliverable and the achievability of this was reflected in earlier discussions in WG3.
- A more integrated approach to fabric, structure and services can be taken.
- Scope to optimise provisions at a building level rather than a unit/dwelling level.
- The SBEM methodology is a little simpler in its analysis of fabric elements than SAP, on issues such as non-repeating thermal bridging.
- The view was expressed that the proposed direction of travel is not a real problem, with emphasis on fabric for ND in general – even on two stage projects such as shell/fit-out.

3.12 On the specific question of values applied to residential ND buildings:

- Is form factor an issue for ND development – are ND residential buildings simpler in form? View was this was not the case.
- Some support for applying Domestic values to ND residential where the function of the building is effectively the same as that of a dwelling.

3.13 On the issue of current improved values for shell buildings:

- Noting improved shell values were to encourage better fabric initially and make subsequent fit-out easier. Experience cites is that it is often not easy to get a shell ‘across the line’.

4. Existing Domestic Buildings & Services WG 17 (21)

4.1 BSD introduced paper 17. This focuses on standard 6.2 and application of fabric limiting values to extensions, stand-alone buildings, conversions and alterations. For fabric, the proposal is to apply a single set of values across all new construction work, matching these to the values set for new dwellings. Proposals for services seek to continue to align any changes in provision with those set by other UK administrations. Discussion started on the fabric proposals.

4.2 **Extensions** – Key points were summarised by BSD:

- One set of fabric values for extensions (no longer dependent upon performance of existing dwelling); simplifies guidance, reflects same level of challenge for all work.
- Proposed values for all extensions are close to the current ‘column a’ (better) values applied for poorer performing dwellings.
- BSD sought views on including non-repeating thermal bridging calculation as part of extension heat loss compliance.
- Compensatory calculation – normally used to enable more glazing in extension – calculation to show actual extension heat loss no greater than for a notional extension.

4.3 In response, the WG offered the following observations:

- WG support abandoning different U-values for extensions.
- Support to include thermal bridging for extensions. Noted this places a new onus on applicant and verifiers via additional calculation element which must be supported by clear guidance.
- Thermal bridging - potential implications for very small extensions; need to use SAP? (not the case). Buildability plays a part.
- Also, as backstops are challenging, favour emphasis on compensatory approach.
- On use of SAP - comparative DER calc – support it but again clear guidance needed on application of process.

4.4 Query on extensions and compliance via improving existing dwelling. Discussion on the whole building approach. BSD noted that current provision seeks to limit such improvement to the difference in heat loss between ‘column a’ and ‘column b’ values so may likely fall with move to single set of fabric values?

Noting that improvement of existing buildings is being addressed under the Energy Efficient Scotland Programme, so trading off extension performance may simply result in a poorer overall building, post-improvement.

4.5 **Conversions** – Key points were summarised by BSD:

- Again looking to standardise values for fabric, aligned with newbuild and extensions.
- Proposal to make no distinction due to the presence of heating (or not) within a building.
- Set out a more evidence-led approach to reporting on conversions where recommended values are only met as far as is ‘reasonably practicable’ (the further flexibility enabled in conversions).

4.6 In response, the WG offered the following observations:

- A further ‘aide memoir’ for reasonably practicable would be supported. Lack of national consistency in this area is the main issue at present.
- Case studies or examples may be useful? Particularly for what isn’t evidence to support ‘doing less’.
- Agree that remove distinction between unheated and heated is sensible - difference is led by what is technically possible.
- On historic, what does ‘good’ look like – practitioners guide (HES) – addressed the issue. Noted that there was an opportunity to re-engage on revision of that document.
- Guidance on what is acceptable - reasonably practicable includes cost of work, but does the owner’s financial benefit have to be taken into account? Should this be investigated via a consultation question on extent this is practicable. Noted that assessment from a cost point of view can be very difficult.
- Should there be advice on the hierarchy of decision-making for ‘reasonably practicable’ (e.g. point above and main driver being ‘technically feasible’).

Action 3: BSD to re-engage with HES on revised practitioner guides.

4.7 BSD noted that examples are useful but would initially seek to define a rules-based process for assessment and reporting. The outcome sought being that ‘doing the best you can’ is simply better evidenced for consideration by the verifier.

Guidance on the process to be applied again can fit within a Compliance Plan approach (as it will include risk assessment). That approach may not include case studies but issues of process would be addressed to improve assurance. An example of concerns expressed by one stakeholder on emissions arising from poor compliance was mentioned.

- 4.8 There was a broader discussion on case studies and resources to support effective improvement of buildings.
- Consider the unintended consequences by changing approach – need advice on how an extension can affect existing building. Issues around saturation of stone, etc. Good case studies and examples of good practice. Including designer-led projects.
 - Reference made to resources such as [Retrofit Scotland](#) and '[under one roof](#)'. Advice on what not to do and on tools that can assist?
 - Reference to resources such as the SEDA sustainable renovation guide which includes whole life cost element (cost versus value) and the 'cost of not doing the work'
 - How can we make best use of the resource and also develop it. Who drives examples to drive forward good practice, particularly if improvement is funded?
 - Learning from last six years, e.g. SG EWI programmes.
- 4.9 **Traditional buildings** – the same considerations but reinforced with a greater need to avoid technical risk from interventions.
- Question around demonstrating competency as part of Compliance Plan approach?
 - HES Practitioners' Guide mentioned again. Needs refresh but still relevant. Remembering that conversion is not just simple traditional buildings but those with protected characteristics (e.g. listed interiors).
 - Not just steading buildings – huge number of historic or listed interiors limiting what you can do with fabric.
- 4.10 **Alterations** – same theme set out, no significant changes. No specific observations from the WG.
- 4.11 **Conservatories** – 6.2 applies only to conservatories and not to other stand-alone buildings (e.g. solid roof 'sunroom'). Suggestion that this is not equitable, offered for discussion.
- There was broad agreement that provisions should reflect anticipated use of a build form, e.g. a stand-alone building within the curtilage of a dwelling unless clear it is not intended for 'habitation'.
 - It was explained that conservatories are not subject to a maximum glazed area and have a relaxed value applied for glazed elements compared to extensions.
 - Noted that if provisions were extended, slight danger that some buildings would be caught which will not be heated, e.g. attached garage. So suitable triggers would need to be defined.
- 4.12 Other points discussed:

- WG member mentioned fuel poverty study review looking at older properties. Examples of a move to low carbon fuel without improvement in fabric, resulted in increased incidence of fuel poverty. Noted this is an issue for both existing homes and, potentially, newbuild. WG noted the term ‘financially beneficial for the end user’ - user normally penalised. So poorly considered change may risk not improving or demolishing. Need to be careful from a balance perspective. Fine line as it is.
- House builder engagement with heat pump manufacturers was mentioned. Focus on newbuild but also relevant to existing premises. Comments offered included that per unit cost favours gas solution; apparent that most solutions do not work as efficiently in low temperatures, can lead to recommendations to uprate equipment/output. Query whether cost of running machines at low temps needs to be represented?
- Noted that Highland Council have gone through a long learning cycle with heat pumps and have a ‘recipe’ that works but does come with certain costs to deliver the levels of performance and assurance sought.
- Potential relevance of BSi PAS documents (2035/38) mentioned. Noted that these are useful for context and as examples of a prescriptive QA process but should not be cited by building regulations.

4.13 **Building Services** – discussion started on points flagged in correspondence from WG members.

4.14 Question on application of ERP rating to boiler efficiency. Noting SAP software continues to cite SEDBUK % efficiencies. It was confirmed that ERP is, in effect, a product label, most applicable to replacement of heat generators. The 92% value equates to ERP Class A products and can be met by a boiler with a SEDBUK efficiency of 89.5%. SAP will continue to use SEDBUK values. Noting that the values cited are for the boiler as a stand-alone product, and that system ERP will increase once controls are taken into account.

Noted that a value of ERP 91% is proposed for replacement oil boilers and that some oil boilers are not this efficient and industry may be unlikely to seek improvement due to trajectory of ending fossil fuel use. Oil boilers do not feature in the proposed Notional Building specification.

4.15 On the topic of replacement heating and an emissions/PE check. For awareness, BSD noted that this issue in England and in Wales is supported by the notification of works process and competent persons scheme, neither of which form part of the Scottish system. Most heat generator replacements do not require a building warrant and would not be subject to oversight by a verifier, so compliance would be addressed by owner/installer.

4.16 The WG noted industry work on commissioning via product manufacturers and the ‘Benchmark’ scheme and linked to warranty. And an ongoing exercise to digitise this process.

- 4.17 Comment was made on controls & commissioning. In relation to the drive towards low temperature heating systems – controls are really important and some issues not necessarily covered e.g. flow return temperatures. Good practice may require better controls, programmable thermostats, and smaller zones beyond building regulations. Should that be a review topic now or for 2024?

BSD noted that the 2021 review is intended to put ‘futureproofing’ elements in place for anticipated adoption of low or zero carbon heat solutions, but this can also be revisited for 2024.

- 4.18 Observation offered that controls are problematic as they need to be appropriate but can be overly complex in domestic or small scale buildings, so benefits in use are not realised. Need simplicity/automation or an informed building manager to avoid potential for misuse. The current advice level is about right for smaller end of the scale. Noting BMS/BACS will have a designated manager.
- 4.19 Query on source of direction on packaged ventilation systems – BSD noted that they are seeking background (likely ERPD) to this but it is a minimum package spec. Comment made on risk of speed controller in domestic environment may allow ventilation rates to be set too low to be effective.
- 4.20 On the format of presentation of information on building services, and the options proposed in the paper.
- The intent to align provisions with the rest of the UK is already noted. The presentation of a consolidated Approved document in England & in Wales but a separate Scottish Compliance guide may be a perception/ presentational issue.
 - Aware industry favour alignment of ‘requirements’ and information.
 - One member noted preference for Compliance Guide format, but flagged a need to remind people that it is part of the Technical Handbooks. Another member noted that we should not feel obliged to follow the other administrations in terms of format.
 - Can also have clearer caveat that makes it clear what is guidance and what is additional good practice (for awareness).
 - BSD noted that whatever the outcome, Scotland would look to retain good practice guidance somewhere. Good practice aligns with a Compliance Plan approach to specification and installation of equipment.

5. Existing Non-domestic Buildings & Services WG 18 (21)

- 5.1 BSD introduced paper 18. As with domestic proposals, this focuses on standard 6.2 and application of fabric limiting values to extensions, stand-alone buildings, conversions and alterations. For fabric, the proposal is to apply a single set of values across all new construction work, matching these to the values set for new ND buildings.

- 5.2 Fabric - Key points were summarised by BSD – these are as discussed for domestic buildings and focus on a single set of values to simplify guidance and reflect same level of challenge for all work.
- Proposed to include non-repeating thermal bridging calculation as part of extension heat loss compliance; compensatory calculation retained. Approach for residential ND buildings would follow proposal agreed for new buildings.
 - WG asked if current application of standard 6.1 to large ND extensions would be retained. BSD confirmed this would be the case.
 - Noting that there was insufficient time to discuss the paper in detail, no issues flagged that are not already covered in discussion of domestic proposals.
 - On conversion of unheated buildings, any thoughts to apply standard 6.1 as is the case for larger extensions? BSD confirmed that there had been early discussion on applying the NCM to conversions but not proposed for 2021. More consideration would be needed on the consequences of such a move and the information that assessment would require.
- 5.3 **Services** – due to limits of time, specific comment sought on proposed new elements. General support for the direction, per discussion for domestic buildings.
- 5.4 Building Automation and Control Systems (BACS) and extent of application – and controls in general
- Proposals do not sound ‘wrong’ so would not recommend change. Other guides or standard are available but cited reference is OK. Would not want to make a requirement of such systems too broadly applicable.
 - Agreement that there is a need to avoid being overly prescriptive on such control systems. Noted that CIBSE IT & Controls group looked at the Part L consultation and did not achieve consensus on the issue. Can direct that group to respond to the Scottish consultation also.
 - There is a need for language in regulations about making controls perform better, suited for the end user – commissioning and operating information critical. Compliance approach separate but also important. Need to recognise there is a big variance in peoples’ ability to understand controls and what systems can do.
 - Comment on provisions for ventilation systems - testing for leakage but also demonstrating effectiveness and energy use. Noted this was part of the wider compliance discussion and evidence.
6. **Any Other Business**
- 6.1 One AOB items offered. Practical application of change once consulted upon. Need to consider opportunities for training for designers and verifiers and could this group assist in this?. The chair confirmed the terms of reference of the group did not extend to this but this could be considered.

- 6.2 The chair thanked the members for their contributions and asked members to send on any further thoughts they had on the topics within papers WG 17 (21) WG (18) 21 and WG 22 (21) to BSD.

Action 4: WG members to consider and provide any further commentary on proposals.

- 6.3 The next meeting will be in three weeks' time (topics: overheating, ventilation & compliance). This will be the final meeting prior to consultation. The chair suggested that BSD set up further meeting slots at three week intervals to support any need for onward discussion prior to and during the consultation period.

Action 5: BSD to send out standing meeting requests for May onward.

Building Standards Division
15 April 2021

New Actions

Item	Owner	Action
1	Scottish Government	BSD to re-circulate biographies
2	All	WG feedback on both actions log and risk register welcome.
3	Scottish Government	BSD to re-engage with HES on revised practitioner guides.
4	All	WG members to consider and provide any further commentary on proposals.
5	Scottish Government	BSD to send out standing meeting requests for May onward.