THE BUILDING REGULATIONS 2012 - AMENDMENT OF TECHNICAL BOOKLET GUIDANCE TO PART F

ACE Northern Ireland submission

About ACE

- We are the association for the UK's professional consultancies and engineering companies operating in the social and economic infrastructure sectors.
- The Association for Consultancy and Engineering (ACE) champions infrastructure and the built environment to government and other stakeholders, representing the views of around 400 members.
- Our members employ over 60,000 in UK and 250,000 worldwide, contributing more than £15 billion to the UK economy. However, the buildings they create actively contribute over £570 billion a year of GVA.
- Our vision is for a political, economic, and commercial environment that enables the consultancy and engineering businesses to thrive and make the world a better place.
- We promote the interests of companies delivering professional services in the natural and built environment. We do this by bringing members together to share knowledge, experience, and insight. This shapes our tangible business support, as well as our proactive engagement with policymakers across the UK.
- Our members provide solutions to some of our biggest challenges – How do we design a Net Zero future? How do we create opportunity for communities across the devolved nations and level-up regions? How can we kickstart growth and jobs on a path to economic recovery? How can we deliver more social value?
- Through ACE Northern Ireland we champion local infrastructure to the Northern Ireland Assembly, not only acting as a pressure group for greater investment, but also as a trusted adviser to representatives in Stormont.
- ACE Northern Ireland has nurtured strong relationships across the political spectrum for a number of years. Our in-depth understanding of the local political environment and the role that infrastructure can play in delivering economic growth and linking communities, ensures we have maintained our role as a trusted adviser, despite recent political uncertainty.
- Committee members include representatives of the following ACE member companies: AECOM, ARUP, Atkins, Capita, Delap, and Waller, JCP Consulting, McAdam Design, Mott MacDonald, OSC, RPS, Troup Bywaters + Anderson, and WSP.

Summary

- Our submission is a summary of responses received from ACE Northern Ireland, following a call for input. We note that some members may have responded to the consultation directly.

Consultation response

2.3 (as outlined in the consultation document)

We are consulting on proposals to uplift the minimum energy efficiency standards for new buildings. Three options have been considered —

- Option 1: do nothing;
- Option 2: require NZEB buildings to better the current Target carbon dioxide Emissions Rate (TER) outputs by 25%, in the case of new dwellings, and 15%, in the case of new non-domestic buildings; and
- Option 3: require NZEB buildings to better the current Target carbon dioxide Emissions Rate (TER) outputs by 40% in the case of new houses, 25% in the case of new flats, and 15%, in the case of new nondomestic buildings.

Options 2 and 3 also propose to uplift fabric standards for new buildings (see paragraph 2.5).
Option 3 is the preferred option with a better overall return on investment. It would deliver more carbon savings and better reductions in energy bills, albeit with higher build costs for developers.

In response to our call for input, members told us that of the three options, option 3 is the preference. However, they don't feel a 15% improvement for Non-Domestic is a significant enough improvement given how far behind Northern Ireland regulations are. This option would only offer a 6% improvement above current regulations in England & Wales. Members expect non-domestic buildings to improve to at least 20-25%.

2.5 (as outlined in the consultation document)

Options 2 and 3 set new limits on fabric standards (common to both options) to:

- require provision of building fabric with U-values and (in the case of dwellings, a glazing assessment), as specified within TBF1 and TBF2 (see paragraph 5.59). A whole building area-weighted U-value assessment provides an alternative approach, provided the overall Uvalues deliver the same level of performance; and
- encourage air tightness testing, including removing options on air permeability assessment for a default value of 15 m3/(h.m2) to be submitted on small sites for untested dwellings and the similar 500 m2 threshold currently permitted for non-domestic buildings.

In response to our call for input, members told us that this is welcomed proposal, however they feel where heat pumps are specified, there needs to be an ""as built"" check to confirm the fabric heat loss of the dwelling is in line with the heat pump sizing, design flow temperature and radiator selection. Additionally, members told us there is a need to ensure in dwellings, that where air tightness levels are designed to or achieve a level of <5.00 m3(m2/hr) @ 50Pa, that guidance in Technical Booklet K is adopted to ensure mechanical ventilation is used. If this is not done, and a building is significantly air tight, this will increase the risk of condensation.

2.6 (as outlined in the consultation document)

All options retain the use of the existing SAP 2009 software, while the new NCM software is developed at UK level. Carbon factors in SAP 2009 do not reflect recent decarbonisation of the electricity grid supply. This means that where the 'betterment' is delivered with an electricity-led solution (e.g. with photovoltaic panels), the actual carbon abatement is likely to be significantly less than the betterment requirements.

4.2 (as outlined in the consultation document)

Given the urgency of the position and a likely need to accommodate new software soon, the proposed uplift has been developed on the basis that the existing software (e.g. SAP2009/SBEM v4) could continue to be used. A further uplift to SAP 10/SBEM v6 will be part of the fundamental review to take into account developments in other regions under Phase 3 proposals.

In response to our call for input, members told us that they have a number of concerns with the continued use of SAP 2009 software for the new regulations. These include:

- Overheating check is oversimplified meaning the risk is often missed in dwellings and apartments.
- Thermal Bridging references are outdated and do not account for the following key thermal bridging details: E20, E21, E24, E25, P6, P7, P8, R1 - R11. These were picked up on SAP2013. If SAP2009 is still used, then the above thermal bridges are ""ignored"" as per conventions.
- Internal lighting is oversimplified to the extent that it has minimal impact on energy and carbon performance. SAP10 and DEAP softwares allow the assessor to input the type of lighting and the efficacy where known: Tungsten, LED, CFL etc.
- DHW consumption and associated energy/carbon is underestimated in SAP2009. SAP10 allows assessors to accurately input the flow rate and number of baths for accuracy.
- The outdated carbon factors associated with electricity and gas within SAP2009 should not be used for forthcoming regulation changes.
- If SAP2009 is retained while the rest of the UK is using SAP2013 with an imminent move to SAP10, and Republic of Ireland (ROI) changed their software from DEAP 3 to DEAP 4, this could mean that Northern Ireland is behind the rest of the UK and ROI.

4.3 (as outlined in the consultation document)

The proposals are designed so that the new NZEB checks could be carried out manually, based on the detail received on the normal output report that the current software already provides for building regulations compliance checks. This will avoid software development costs and implementation delays, although software developers would be free to adjust their products to provide for the new requirements, should they wish (the Department would encourage this).

Q2: Do you agree that additional manual checks of current software reports will be manageable in practice to demonstrate compliance in relation to the new requirements for:
a) the betterment of the TER;

b) an air-tightness performance no greater than 10 m3/(h.m2) at 50Pa; and
c) new U-value limits for building fabric (see paragraph. 5.59 on this below)?

- Yes
- No

If no, please explain your reasoning and provide supporting evidence or alternative.

In response to our call for input, members responded 'Yes'. They also reiterated points made in 4.2 on SAP2009. If manual checks are introduced, our members argue there is a need to ensure that a check is applied to ensure Heat Pumps and radiators are installed correctly and as designed. This can take the format of a Heat Pump Design Installer Form, which is completed at built stage.

If this isn't done, there is a risk that heat pumps will be installed in inadequately insulated dwellings, which results in the heat pump not being able to meet the heating demand. This could lead to excessively high bills for the user and ultimately the system being replaced with a fossil fuel alternative.

There will already be concern in the industry and market in switching to heat pump technology. Our members note the need to ensure checks are in place to ensure the systems are designed and installed properly.

It is suggested that a standardised pro forma (or sample submission information) could be made available along with the technical booklets which would outline the anticipated submission format to Building Control. This would ensure that Building Control and those submitting to Building Control both have clarity in what is expected to be submitted in order for Building Control to verify compliance. It would be anticipated that any pro forma could then be submitted to Building Control in addition to the SAP output / SBEM BRUKL. By doing this, it is likely to minimise the need for correspondence between Building Control and those submitting proposals and minimise avoidable rejections which can cause delay.

4.4 (as outlined in the consultation document)

Given the long-standing notice of an NZEB requirement and the lack of substantive change to Part F requirements since 2012, the Department considers that industry should be well placed to respond to an uplift of this scale and nature. The intention is, therefore, to implement the new guidance as soon as possible with a view to coming into operation some three months after publication. The Department is aiming for the new guidance to apply to new plans applications from as early in 2022 as practicable.

Q3: Do you agree that the new guidance should apply from three months of publication of the guidance and from as early in 2022 as practicable?

- Yes
- No

If no, please explain your reasoning and provide evidence for an alternative timescale.

In response to our call for input, members responded 'Yes', but highlighted that allowances will need to be made for transitional requirement for projects which have already received planning and are due to start on site in 2022.

It is noted by members that this will be a significant step change for the construction sector given how far NI TBs have been languishing behind other jurisdictions, but somewhat mitigated by the fact that manufacturers and supply chains already have familiarity with requirements in other jurisdictions and as such should be in a position to react quickly.

The impact assessment notes that the additional costs associated with uplifts in the requirements are likely to be borne by land owners in the longer term, but consideration needs to be given to the impact in the shorter term where perhaps a site has already been procured and existing cost plans do not factor in regulatory change of this nature, especially in an environment of persistent prevailing cost inflation. Consideration should be given to permitting 'early' building control submissions to allow those with plans already in motion to 'book in' under the current regulations or provide some other mechanism (e.g. recognising approved planning permission etc subject to checks that this isn't being manipulated).

When consulting on this response, a member gave the following example:

*"*a couple who have sold their home and are living on their domestic site springs to mind. This couple have the proceeds of their house sale, minus the cost of the site ad temporary accommodation, to pay for design fees, statutory fees, construction costs etc. At present this couple is making changes to their plans (which are quite modest to begin with, detached & rural so likely oil-fired) to reduce costs in order to come within their budget, having had to readjust for material cost inflation. If this couple cannot get their revised plans reapproved with planning and an application into building control in time, they may see costs escalate to an extent that the build is no longer affordable, and they effectively become homeless. Whilst in this example, there may be enough time for this project to be sufficiently progressed, in other similar examples there won't be and as such there should be a mechanism available to allow discretion in these limited circumstances."

Q4: Do you agree that Option 1 should be dismissed?

- Yes
- No

If not, please provide the evidence and basis for why the current standards are appropriate and should be retained.

In response to our call for input, members responded ‘Yes’. They highlighted that doing nothing is not acceptable given the current climate and NZEB targets & timelines.

Q5: Do you agree that the above proposals provide an appropriate interim step, which can be implemented quickly?

- Yes
- No

If no, should they be more onerous or less onerous? Please explain your reasoning and provide supporting evidence for alternative suggestions, taking into account that further review is planned for 2022/23.

In response to our call for input, members responded ‘Yes’. They noted that these proposals do represent a reasonable interim step, but an interim step can only be taken if assurances are made in terms of what the

purpose of the 2022/23 review will be. Members also highlighted the importance of a thorough review of regulations, softwares and assessment methodology taking place.

Some members also expressed a view that an opportunity has been missed in 2013 to review and implement technical booklets introduced in England and Wales which has increased the urgency of bringing in new requirements. Given the delay which may be introduced by waiting to react to updates in UK NCMs, members support the introduction of an interim step as a means to expedite improvements on the energy use / carbon emissions of NI buildings and also to limit the extent of the step change that new incoming UK NCMs will likely introduce. This will permit local supply chains to adjust to the trajectory required to meet NZEB requirements.

Do you prefer Option 3 (40% betterment of the TER for houses, 25% for flats and 15% for new non-domestic buildings), or are the standards outlined in Option 2 (25% betterment of the TER for all dwellings and 15% for buildings other than dwellings) preferred?

- Preference is for Option 1 (do nothing)
- Preference is for Option 2
- Preference is for Option 3
- None of the above

If answering 'None of the above', please take into account and advise if proposals described here should be delayed or halted, in order to progress in line with your suggestions.

In response to our call for input, members noted a preference for Option 3. This option will likely see a significant transition away from boilers toward heat pumps. Assurances and checks need to be in place to prevent bad design and installation of heat pumps technologies, as outlined in response to 4.3 above.

Members also highlighted that this option is the most ambitious proposal put forward and impact assessments suggest in the cost analysis that additional build costs can expect a 3–5-year payback. Some caution needs to be applied to ensure that the increased adoption of heat pumps which this is likely to drive is accompanied by good overall design, otherwise building owners may suffer 'bill shocks' which would create 'negative press' and impact upon the future adoption of heat pumps.

Q7: Do you agree that the definition of 'flat' in regulation 2 provides a sufficiently clear discrimination of the building types to enable the different betterment rates to be applied to houses (40%) and flats (25%)?

- Yes
- No

If no, please explain your reasoning.

In response to our call for input, members gave mixed views. Some were supportive, whilst others noted that by the given definition, a dwelling above a shop for example would not be deemed to be a flat as it is vertically separated from the remainder of the building rather than the horizontal division which the definition states. The definition refers to including a maisonette, but some argued this should stand separately from the horizontal division statement, in order to capture the example above.

Q8: Do you agree that the proposed DER requirement for a 25% betterment of the TER should be applied to flats?

- Yes
- No

If no, should they be more onerous or less onerous? Please explain your reasoning and provide supporting evidence for alternative suggestions, taking into account that further review is planned for 2022/23 and that other building regulation proposals are likely to impact some flats.

In response to our call for input, members agreed with the proposal, but stressed that clarity should be given in terms of how PV is apportioned to apartments in the instance of a large array serving multiple apartments.

Members reflected that the balance point of 90% of flats should be able to comply with LPG or natural gas, with the remaining 10% requiring something along the lines of heat pumps is perhaps lacking in ambition and it could be expected that the targets could be stretched such that this balance point is closer to 75%/25%. Members also expressed disappointment that NIE infrastructure matters are the limiting factor in these proposals and it is suggested that more be done to increase the G98 threshold output or support the introduction of battery storage.

Q9: Do you agree with the heat pump costing assumptions (see Annex A in the Regulatory Impact Assessment (RIA)), the 10% incident rate estimate for flats and the proposed level of uptake for heat pumps in houses, used in our modelling (see Annex C in RIA), appropriate?

- Yes
- No

If no, please provide the basis for an alternative rationale, which should apply.

In response to our call for input, members said that the costing seem reasonable, but again, this is on the basis of correct design and install. Members also highlighted how very few projects now use Gas / LPG and PV. Some also said they would support a more challenging target which would see the uptake of heat pumps increasing beyond 10%.

Q10: Do you agree that the Department should make any necessary adjustment to attend to replicating the treatment of heat pumps proposed under Part L revisions in England for non-domestic buildings?

- Yes
- No

If no, how should the Department avoid overshooting England's requirements in this regard?

In response to our call for input, members responded 'Yes'. Current electricity carbon factors used in SAP 2009 & SBEM are outdated and can artificially restrict the use of heat pumps. If the carbon factors are more reflective of current electricity grid carbon, then these would be adopted on more projects. As such it makes sense to make these adjustments to encourage the adoption of heat pumps.

The current definition of a heat pump would include air to air heat pumps such as direct expansion air conditioning / comfort cooling systems frequently deployed in non-domestic buildings and frequently in offices and retail. Is the intention to also encourage use of these systems and if not, the definition would need to be amended. As a reference point, members noted that sustainability metrics such as BREEAM try to discourage the use of air conditioning / comfort cooling systems due to the impact on the environment of

the refrigerants they contain. On an air source to water or ground source to water type heat pump the refrigerant content is small and contained within the heat pump equipment, however on air conditioning systems the indoor and outdoor units are most often interconnected by a system of pipework which significantly increases the refrigerant content.

Q12: Do you support the overall proposals for buildings other than dwellings, including proposed BER requirement for a 15% betterment of the TER for new non-domestic NZEB buildings?

- Yes
- No

If no, should the proposals be more onerous or less onerous? Please explain your reasoning and provide supporting evidence for 28 alternative suggestions, taking into account that further review is planned for 2022/23.

In response to our call for input, members responded 'No. It is felt that the 15% target is significantly lacking in ambition and should be closer to 25% improvement at this iteration, even when taking on board that a further review is planned for 2022/23. Reviewing the document, it is understood that the betterment has been limited to 15% to avoid overshooting the incoming England & Wales improvements expected in 2022. With reference to Table 5.1 of the consultation document, it would appear that if the example of hotels is excluded, a target of 25% is an achievable target avoiding overshoot.

It is acknowledged from the narrative that it is anticipated that it is the high domestic hot water heating load that leads to hotels only showing a c. 15% improvement over NI current standards when applying the proposed England & Wales Future Buildings provisions. It is suggested that rather than limiting the ambition to 15% improvement due to a small section of the building stock, that some special mechanism is built into the betterment requirements to factor for domestic hot water dominated buildings (or discretionary dispensation) and the target betterment lifted to something more ambitions like 25%.

Q13: Do you agree that adopting the 2013 edition of the Non-Domestic Building Services Compliance Guide is worthwhile and would be at negligible cost to current practice?

- Yes
- No

If no, please provide evidence to explain where this would be difficult or how cost assumptions should be revised.

In response to our call for input, members responded 'Yes'. This is embedded in existing supply chains and is simple to implement.

Q14: Do you agree that the guidance revising the limiting U-values is worthwhile and workable for industry and enforcement?

Yes
No
If no, please explain your reasoning.

In response to our call for input, members responded 'Yes'. They noted that the introduction of a new differentiation between flat roofs and pitched roofs should be accompanied by an angle or other definition to describe the demarcation point between a flat roof and a pitched roof to avoid confusion or potential conflict in opinion.

Q15: Do you agree that the revisions to guidance on thermal bridging are a helpful clarification of current processes?

Yes
No
If no, please explain your reasoning.

In response to our call for input, members responded 'Yes'. Members also noted that in SAP2009 the thermal bridging references are outdated. It does not account for the following key thermal bridging details: E20, E21, E24, E25, P6, P7, P8, R1 - R11. These were picked up on SAP2013. If SAP2009 is still used, then the above thermal bridges are 'ignored' as per conventions. Members would like to see revision of the ACDs as the same Psi Value is applied regardless of construction method.

It is highlighted that for non-domestic buildings, the typical accepted mechanism for capturing a thermal bridging coefficient is to allow for a numerical magnitude of 10% of the u-value. Given the focus on thermal bridging in domestic buildings, it is suggested that improvements are necessary in capturing thermal bridging coefficients in non-domestic buildings.

Q16: Do you agree with the removal of the default values for airpermeability of 15 m3/(h.m2) currently permitted?

- Yes
- No

If no, please explain your reasoning.

In response to our call for input, members responded 'Yes'.

Q17: Do you agree that the overall proposed changes on fabric standards are helpful to support a 'fabric-first' approach?

- Yes
- No

If no, please explain your reasoning and what should be done, taking into account that any significant review may delay implementation.

In response to our call for input, members responded 'Yes', but noted that DFEE and TFEE targets should be introduced as per SAP2013 and SAP10.

Q18: Do you agree that the guidance on non-export connections is helpful?

- Yes

- No

If no, please explain your reasoning.

In response to our call for input, members responded ‘Yes’. Members also referenced that it is somewhat disappointing that NIE infrastructure matters are the limiting factor in these proposals, and it is suggested that more be done to increase the G98 threshold output or support the introduction of battery storage. It appears that limitations in the NIE infrastructure are therefore being 'baked into' the targets of the technical booklets (TBs) - should NIE increase the threshold then the technical booklets will not be able to react until the next update which could therefore miss opportunities for furthering energy improvements and carbon savings in buildings. Should the TBs not set more ambitious targets which encourage NIE to improve their acceptance thresholds or challenge designers to come up with more innovative proposals.

Given that current calculation tools cannot differentiate on electricity export limitations, there is a flaw in this current mechanism. For example, theoretically a building could just have a large PV installation include in energy modelling and sail through TB F, but this may not be practical in reality and the full benefit of the PV installation not realised in terms of energy savings or carbon emissions due to insufficient on-site demand.

Clarity is required on what evidence or documentation is required to be provided to Building Control in relation to electricity export limitations, or this could be included in the pro forma suggested in the Question 2 response.