



Building Regulations
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17 January 2022

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Dear Sir

Welsh Government Consultation on Building Regulations Part L and F Review: Stage 2B

The Institute of Historic Building Conservation is the professional body of the United Kingdom representing conservation specialists and historic environment practitioners in the public and private sectors. The Institute exists to establish the highest standards of conservation practice, to support the effective protection and enhancement of the historic environment, and to promote heritage-led regeneration and access to the historic environment for all.

We are very pleased to have the chance to comment on the consultation document. The Institute's comments are as follows:

This is the last of three linked consultations from the Welsh Government to uplift the energy efficiency and ventilation standards for new and existing non-domestic buildings to come into force in 2022. These proposals to make new and existing buildings more energy efficient will be implemented through changes to the Building Regulations and supporting Approved Documents F and L. The document provides a strategic overview of the key priority areas for action and milestones

needed for the Welsh public sector to reach net zero greenhouse gas emissions by 2030.

This is a complicated consultation that will empower industry specialist in Wales to make changes to how we ventilate and conserve fuel and power in our buildings and address the possible consequences of overheating.

Compared to homes, non-domestic buildings are more diverse in type, size, complexity and function. The Part L 2025 Standard needs to reflect the diversity of non-domestic buildings. Performance issues here are likely to involve a wider range of technical challenges.

The majority of the consultation questions relate to new buildings and not to existing buildings except in certain situations. For example, Paragraph 10.9 of Approved Document L may have an influence as an extension can be considered as a new building and the fixed building services, building automation and control systems etc should comply with the new requirements. Therefore, these comments are restricted to general aspects on how the proposals will impact on existing historic buildings in the following situations:

1. Renovation of thermal elements and limiting heat gains and losses (Regulation 23 (1) and L1 (a)).
2. Material changes of use and change to energy status (Regulations 6 and 22).

Exemptions and special considerations for historic and traditional buildings.

Part 6 of the Building Regulations imposes additional specific requirements for energy efficiency. If a building is extended or renovated, the energy efficiency of the existing building or part of it may need to be upgraded. An exemption applies to buildings included in the schedule of monuments maintained under section 1 of the Ancient Monuments and Archaeological Areas Act 1979. The Guidance provides for historic and traditional buildings concerning ventilation standards in the approved document to include:

- a. Those listed in accordance with section 1 of the Planning (Listed Buildings and Conservation Areas) Act 1990;
- b. Those in a conservation area designated in accordance with section 69 of the Planning (Listed Buildings and Conservation Areas) Act 1990: and
- c. other historic buildings that have a vapour permeable construction that both absorb and readily allows moisture to evaporate. These include: wattle and daub, cob, stone and constructions using lime render or mortar. Work on the the buildings mentioned in a- c should comply with the ventilation standards in this approved document to the extent that it is reasonably practicable. The work being done should not: unacceptably affect the significance of the listed building, conservation

area or scheduled monument; or increase the risk of long-term deterioration of the building fabric or fittings.

New extensions to historic or traditional buildings should comply fully with the standards of ventilation in this approved document unless there is a need to match the external appearance or character of the extension to that of the host building. The local authority's conservation officer should be consulted when doing work to a building referred to at a – c. There are additional provisions concerning ventilation where windows are changed and the ventilation should be no worse than prior to the work being carried out.

In relation to the approved document L concerning conservation of fuel and power places of worship are exempt together with adjoining spaces used directly for that use. There are exemptions for listed buildings, buildings in conservation areas and scheduled monuments where energy efficiency requirements would unacceptably alter their character or appearance. The consultation document suggests that reasonable provision is again made for historic and traditional buildings. Historic and traditional buildings should only have their energy efficiency improved to the extent that it does not risk the long-term deterioration of the building fabric or fittings, in particular those that have a vapour permeable construction that both absorb and readily allow moisture to evaporate. These include wattle and daub, cob, stone and constructions using lime render or mortar. New extensions to historic or traditional buildings should comply fully with the standards of energy efficiency in this Approved Document unless there is a need to match the external appearance or character of the extension to that of the host building. In determining whether full energy efficiency improvements should be made, the Building Control Body should take into account the advice of the local authority's conservation officer.

It is important to take the following matters into account concerning historic building fabric:

Old buildings were traditionally constructed with technologies handed down through generations which allowed the building to breathe naturally. The building fabric was constructed in natural materials usually solid walls providing good permeability and flexibility. External surfaces were designed to absorb moisture and allow it to evaporate away naturally through porous surfaces, very much like an old great coat. This is in total contrast to modern technologies where rain screens are designed to deflect the moisture away, very much like a plastic raincoat. You cannot mix and match the two technologies without causing fundamental problems.

Critically whilst there are exemptions and special considerations for historic and traditional buildings there is no practical guidance contained in the Approved Documents for the uplifting of requirements for traditional, historic and listed buildings proposed by Approved Documents F and L. Instead, the Approved Documents favour guidance for modern forms of construction, which from experience industry develop into off the shelf systems adopted by designers, builders, home owners, approved by building control and inappropriately applied to traditional historic and listed buildings. This shortcoming needs to be addressed.

The Approved Documents set out what in ordinary circumstances may be acceptable as reasonable provisions for compliance with the relevant requirements of the Building Regulations. As there is no practical guidance for traditional buildings in the Approved Documents this will have the effect of practitioners favouring inappropriate modern solutions for non-vapour permeable applications and it is difficult to control and regulate without proper up to date guidance in the Approved Documents. Even the additional Historic England guidance (from 2017) mentioned in paragraph 0.15 of Approved Document L has been superseded by new research. Without proper guidance, the implementation of proposed inappropriate modern non breathable insulation systems will only make this situation worse. This is a critical omission.

Much technical research concerning energy saving measures and renewable energy resources in the context of historic buildings available to support the content of this submission by a range of organisations such as SPAB; Historic England; Historic Environment Scotland and the National Trust for Wales. These address some of the issues of concern and provide approaches which will not impact negatively on historic character.

Question 2: Heat pumps

The use of heat pumps and heat networks used to heat buildings will be based on heat loss calculations which encourages higher levels of insulation to be applied to buildings to ensure heating systems are not significantly oversized. It is likely that buildings will need to be insulated to higher standards than those in Approved Document L for heat pumps to actually work. This strategy would be of serious concern if applied to existing buildings of traditional solid wall construction. For example, well-placed sources in building control are reporting instances of proprietary non vapour permeable highly insulated modern insulation and render systems up to 200mm thick being specified for existing buildings together with triple glazing to windows just to ensure air source heat pumps will work. Although there are exemptions and special consideration for traditional buildings with solid walls, without proper

guidance, the installation of inappropriate insulation systems could be applied to solid vapour permeable walls with potentially disastrous results.

Question 9: Modelling

In Approved Document L, the current SBEM assessment method is to be replaced by a new revised SBEM (Simplified Building Energy Modelling).

Meaning of SBEM- SBEM is the approved national calculation methodology used to calculate the energy efficiency of:

- (i) New non-dwellings (with certain exemptions for places of worship, low energy buildings, temporary buildings, small detached buildings, conservatories and porches)
- (ii) Large extensions to non-dwellings with a useful floor area greater than 100m² and greater than 25% of the useful floor area of the existing building. Constructing an extension in a building with a total useful floor area greater than 1000m² triggers the requirement for 'Consequential Improvements under regulation 28. However there appears to be some ambiguity regarding what constitutes Consequential improvements under section 12 and Appendix D of Approved Document L.

The SBEM calculates the monthly energy use and carbon emissions of a building based on its size, orientation, geometry, construction and systems.

The revised *SBEM* will be more onerous and require higher levels of thermal improvement to achieve targets. The majority of *traditional* buildings will not be affected by this requirement, however those that are will not be able to achieve this and the risks and unintended consequences of taking action should be analysed. An arbitrary requirement to uplift increase thermal levels and building service improvements cannot be applied safely to some types of building. Applying internal or external insulation systems can lead in buildings of traditional construction to problems such as condensation and overheating. Guidance on application should be made clear in the Approved Documents to overcome this potential problem.

Therefore, to ensure consistency to the regulation, consideration should be given in the Approved Documents for a simple process to assess the suitability of the traditional building for the application of types and thickness of vapour permeable or non-vapour permeable insulations and types of heating systems when it is appropriate to do so.

Question 10: Levels of uplift

There are concerns already being raised by industry and practitioners that the elemental U-value requirement of 0.3 in Approved Document L for upgrading solid walls to traditional buildings are unrealistic and problematic as it traps water, caused deterioration of the building fabric and increases the risk of condensation and mould growth that can affect the occupant's health. It is vital that where external solid walls are required to be uplifted through renovation or material changes of use there should be flexibility and guidance stated in the Approved Documents for the U-value requirements to be accepted to a lesser and more realistic standard. Without this flexibility, we have it on good advice that building control bodies will insist on these stated uplifting levels and then practitioners' default to modern insulation systems that are thinner in profile, cheaper and are inappropriately applied to traditional solid walls with often problematic results.

Question 24: Moisture risks

As stated in question 9 above, we suggest that BS 5250:2021 BSI Publication '*Management of moisture in Buildings- Code of Practice*' should be specified in the Approved Documents C, F and L to check for potential condensation risks in buildings. The problem with using some of the well-known commercial hygrothermal modelling systems is that it is too costly and expensive and there simply won't be enough capacity to do every building in the country. Well-placed sources have confirmed that industry and practitioners are preparing bespoke checklists to assess the risks and needs of particular buildings and as the risk increases (for example masonry with poor breathability or impervious paint on the outside, thicker insulation, poor ventilation etc) this will flag and warn the designer to commission a hygrothermal modelling calculation to assess the risk in more depth.

Therefore, to ensure consistency to the regulation, consideration should be given in the Approved Documents for a simple process to assess the suitability of the traditional building for the application of types and thickness of vapour permeable or non-vapour permeable insulations and types of heating systems when it is appropriate to do so.

Question 27: BR 443

BR 443 provides conventions which are used for the calculation of the rate of heat loss through individual components of the building envelope. The U-values of existing old stone walls, roof or floors is difficult to determine due to difficulties with establishing the exact form of construction and thermal properties of the materials used. This is particularly relevant to traditional buildings with solid wall construction.

Account should be taken of the fact that solid wall construction of any appreciable thickness also acts as a thermal store, retaining heat provided a low level of heat is constantly maintained. The default values

suggest that the U-Values of solid masonry walls are worse than they are in reality on most occasions leading to the requirement to insulate the walls. This will not improve the insulation values of the walls by the target amount since the walls are already performing better than the initial reading indicates.

The revised SBEM assessment methods in Approved Document L are going to be more onerous and require higher levels of thermal improvement to achieve targets. Where SBEM assessments are applicable, many traditional buildings will not be able to achieve this and the risks and unintended consequences of taking action should be analysed. An arbitrary requirement to increase SBEM levels cannot be applied safely to many types of building. Applying high levels of insulation to buildings of traditional construction will cause problems such as condensation and overheating.

Requiring an in-situ U-value test may be the answer rather than a remote calculation and could more accurately give the real U-value in a wall and reduce the risk of costly mistakes for wrongly installed insulation which may not increase the actual U-value and cause damaging problems. However, the time needed to carry out in-situ testing may be a bar to development and be an unacceptable economic factor. Therefore, consideration should be given in Approved Document L for a simple process to assess the suitability of traditional buildings and include a range of suitable U-values for solid walls.

Conclusion

IHBC wish to emphasise and reinforce that it is vitally important that any proposals contained within Approved Documents F and L should have proper consideration and guidance for the thermal uplifting and improvement of energy efficiency measures of traditionally built solid wall buildings to ensure appropriate solutions are applied to traditional forms of construction based upon the assessment of risk to prevent potentially disastrous results.

Yours sincerely,

Fiona Newton
IHBC Operations Director