

## **Extract of dissertation titled:**

### ***‘Are the Building Regulations fit for the purpose of upgrading traditional, historic and listed buildings using modern applications in Wales?’***

This appraisal is an extract of my recent MSc dissertation that focuses on the complex interrelations of concerns that the Building Regulations and supporting Approved Documents produced by the Welsh Government are not fit for purpose when carrying out building works to traditional, historic and listed buildings. The Approved Documents are held up as a means to question the suitability for their application and consequences if they are not, and what can be done to ensure they are fit for purpose.

This research was carried out by the report author who has 28 years' experience in building control as a team leader and chartered building surveyor working for a Local Authority in England on the Welsh Boarder. With special partnership arrangements, Local Authorities based in England can carry out building control functions in Wales and vis-versa. This requires dealing with two separate systems of building control which are almost identical.

This report begins by describing the background to vapour permeable (breathable) construction and problems associated with upgrading traditional buildings using the Approved Document to the Building Regulations and recognises significant gaps in this legislation. It considers the drivers of change for making improvements to the Welsh building stock. It also considers case studies which draw out the consequences of applying modern methods of construction to traditional buildings. A literature review then follows to gain a better understanding of how scholars view the Building Regulations and Approved Documents. A questionnaire survey then assesses how the construction industry view the Approved Documents to the Building Regulations, followed by suggested solutions to the problems.

The report concludes with key findings and finds that the Building Regulations and supporting Approved Documents produced by the Welsh Government (and can equally be applied to England) are not fit for purpose when carrying out building works to traditional, historic building and listed buildings. Finally, there are recommendations on how the problems could be resolved without placing these important buildings or occupants at risk.

## **Key findings**

1. This study has found discourse within the construction industry that government policy on sustainability of traditional, historic and listed buildings is dominated by a positivist, neo-liberal agenda underpinned by a utopian belief in technological progress and power of the market.
2. Non-vapour permeable applications are being inappropriately applied to traditional forms of vapour permeable construction with disastrous results.
3. Approved Documents to the Building Regulations do not provide enough practical guidance for traditional buildings.

4. The Welsh Government is unlikely to make any changes to the Approved Documents unless there is good reason.
5. Current U-value calculations underestimate the actual thermal performance of traditional solid walls.
6. The Building Regulations Elemental U-value requirement of 0.3 for upgrading traditional buildings are unrealistic and problematic as it traps water and increases the risk of condensation and mould growth. The U-value should be increased to 0.7.
7. Drivers of change for improvements and energy efficiency measures have been brought about by:
  - a. Owner's aspirations of improved thermal comfort
  - b. Changes in climatic conditions
  - c. Changes in legislation and the Building Regulations
  - d. UK Government driving ever improving insulation standards and decarbonisation targets
8. Case studies confirm Approved Documents are being inappropriately applied to traditional, historic and listed buildings (see Appendix A).
9. Standards reviewed for retrofit are insufficiently detailed in respect of solid wall insulation and are not fit for purpose.
10. Industry produced standards providing guidance are too expensive to buy and the public are reluctant to use them.
11. Criticism that patented vapour preamble solutions provided by the private sector are exclusive and too expensive.
12. Three solutions to the problems were recommended:
  - a. Make changes to the Approved Documents to the Buildings Regulations
  - b. Produce a National Compliance Guide
  - c. Invest in technical solutions, training and information hub.

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**Appendix A:** Case studies confirming guidance in Approved Documents is being inappropriately applied to traditional, historic and listed buildings some with unintended consequences

**Case study 1: Conversion of Grade II listed dovecote into holiday let in 2018.**



**Figure 1:** Upgrading of solid walls with modern non-vapour permeable tanking membranes and high density polyisocyanurate insulation board (Source: Gwynne 2018).

**Case study 2: New ground floor to grade II listed church in 2019.**



**Figure 2:** Polythene damp proof membrane laid over the floor area and dressed up walls (to hide existing rising damp) ready to receive 100mm thick high-density polyurethane insulation board, 100mm dense concrete slab and ceramic tiles (Source: Gwynne, 2019).

**Case study 3: Conversion of stables into holiday let in 2018.**



**Figure 3:** Water proof tanking system fixed to top of original floor and internal face of solid stone walls to prevent damp ingress ready to receive a high density polyisocyanurate insulation board and concrete slab to floor and same insulation fixed between timber stud walls with vapour checked plaster board fixed around the inside perimeter (Source: Gwynne, 2018).

**Case study 4: Damp in solid house walls renovated with hard non- permeable cement render and plaster finishes (works originally carried out in 2009).**



**Figure 4:** Rising damp and Crypto fluorescence pushing off hard gypsum plaster (Source: Gwynne, 2017).



**Case study 5: Collapsed cob walling -renovated with hard non- permeable cement render and internal plaster board finishes in December 2019.**



**Figure 5:** Collapse of the cob wall caused by water trapped behind hard cement render (Source: Gwynne, 2019).