

Introduction to Part O

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CIBSE HVAC Group – Part O and Overheating

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About Inklings



- **Building Physics Consultancy**
 - Susie Diamond
 - Claire Das Bhaumik
- **Services**
 - Design stage overheating risk assessments for all building types **now including Part O reports**
 - Thermal performance and TM54 analyses
 - NABERS modelling and Design Review services
 - Advanced HVAC modelling
 - Part L2A compliance modelling and advice
 - Research



Part O

- Comes into force June 15th 2022 (with some transitional arrangements)
- Applies to all new homes including care homes, boarding schools and student accommodation
- Aimed at reducing overheating risk



 HM Government

The Building Regulations 2010

Overheating

APPROVED DOCUMENT



Requirement O1: Overheating mitigation
Regulations: 40B

2021 edition – for use in England

Additional requirements - noise



- Noise limits set for bedrooms at night
 - 3.3 Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.
 - a. 40dB $L_{Aeq,T}$ averaged over 8 hours (between 11pm and 7am).
 - b. 55dB L_{AFmax} , more than 10 times a night (between 11pm and 7am).
- Apex acoustics have estimated over 30% of existing UK homes would exceed these criteria
- No practical guidance given on how measurements should be taken or who by
- No distinction made between different noise sources: birdsong, road traffic, high winds etc
- Useful blog: <https://www.apexacoustics.co.uk/noise-constraints-in-approved-doc-o-overheating-part-1/>

Implications of exceeding noise criteria



- Affects night time only in Part O
- May still be possible to meet acoustic limits passively
 - reducing window openings at night
 - using acoustically attenuated vents or acoustic barriers
- Mechanical ventilation solutions may be needed at night

BUT

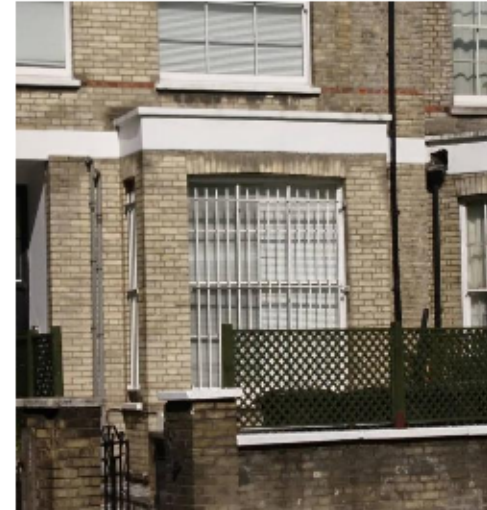
- If noise limits use of opening windows during the day too - triggers change in TM59 criteria
 - No longer adaptive thermal comfort
 - Fixed hours $>26^{\circ}\text{C}$
 - Challenging for some locations (mostly SE England)
 - May necessitate mechanical cooling



Additional requirements - security



- Windows relied upon for night-time ventilation must be secure
- Bedrooms on ground floors or that are easily accessible can be made secure with:
 - Fixed or lockable louvred shutters
 - Fixed or lockable grilles or railings



Additional req – Protection from falling



- Windows that open more than 100mm must also:
 - Have handles that operate with a maximum reach outwards of 650mm from inside face of wall
 - Sill heights or guarding >1100mm
- Guarding can include:
 - Shutters with a child –proof lock
 - Fixed guarding
 - But should not allow children to easily climb it

Table 3.1 Guarding heights

Change in floor level between inside and outside	Guarding height ⁽¹⁾
Less than 600mm	See Approved Document K
More than 600mm	1.1m

NOTES:

1. This approved document has increased levels of protection from falling compared to Approved Document K. Where applicable, the higher standard applies.
2. Guarding should be sized to prevent the passage of a 100mm sphere.

Simplified method



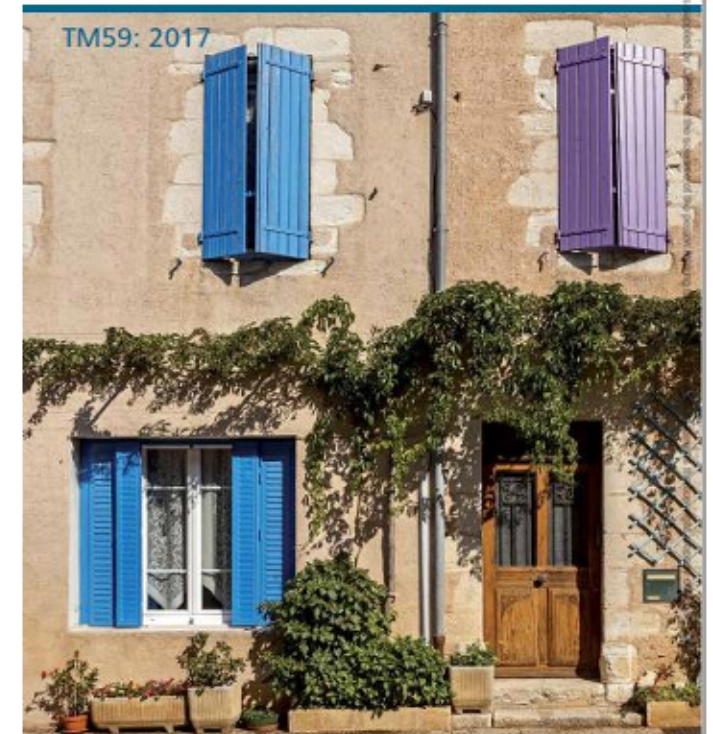
- Not as simple as it sounds
- All units must be assessed
- Two requirements
 - **Maximum limits on glazing areas** (plus shading in London)
 - **Minimum limits of free areas** (useful openings created when windows are open)
- These targets vary depending on:
 - Location of the site (high (mostly London) or moderate risk)
 - Whether the unit meets the criteria for cross-ventilation (windows on **opposite** facades)
 - The floor area of the unit (GIA), bedrooms and most glazed room

Dynamic Thermal Modelling method



- Based on CIBSE TM59
- Representative sample of units assessed
- Two Criteria:
 1. adaptive thermal comfort tested in all rooms
 2. additional night time hours of exceedance test for bedrooms
- Criteria change if predominantly mechanically ventilated
- Small changes to how window openings are modelled
- **No blinds or curtains!**
- Results for each occupied room

Design methodology for the
assessment of overheating
risk in homes



Which method?



Simplified

- Cheaper to assess
- No specialist software needed
- No experienced modeller needed
- All units must be assessed

Dynamic thermal modelling

- More design flexibility
- Choice of weather file to match site location
- Smaller sample of units assessed
- Easier to pass?



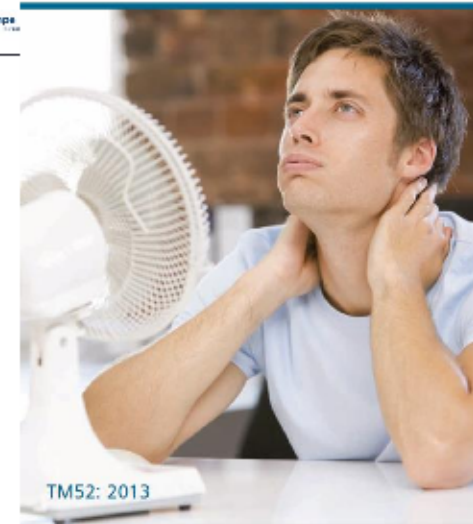
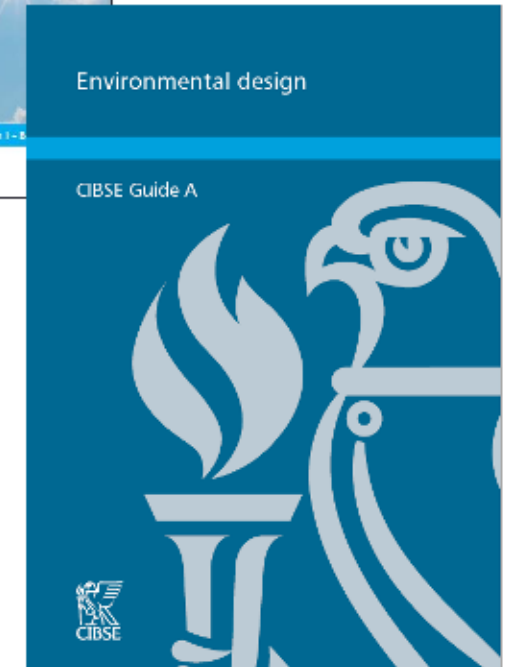
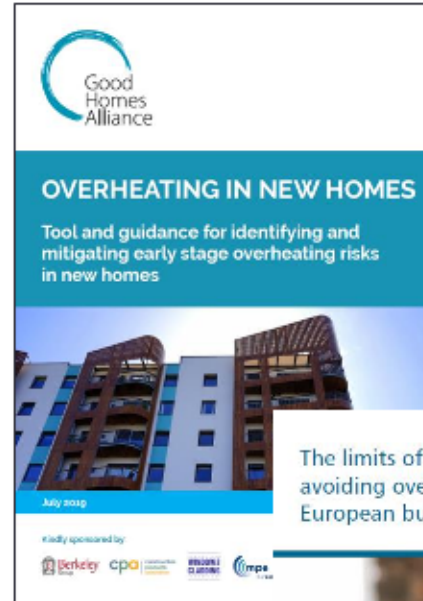
Summary



- The simplified method is time consuming and not simple to apply, plus looks difficult to pass, especially (weirdly) in lower risk locations
- Initial research suggests that the results from the simplified and dynamic modelling methods do not always correlate very well
- Locations in cooler/windier parts of the country are grouped with warmer locations in the south
- TM59 likely to be default option in London, and offers significantly more flexibility, but will still be challenging

Other Resources

- GHA One-page tool for:
 - Existing homes
 - Retrofit
- CIBSE TM52 (non-domestic, free-running)
- CIBSE Guide A
- Coming soon:
 - Future Homes Hub Guidance
 - FAQs to Building Control



The End



Thank you for listening!

Susie Diamond

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