The Future Building Standard

CIEH response to a consultation by MHCLG on Building Regulations: Approved Documents F and Overheating

April 2020

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Environmental health has an important and unique contribution to make to improving public health and reducing health inequalities. CIEH campaigns to ensure that government policy addresses the needs of communities and business in achieving and maintaining improvements to health and health protection.

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Key points:

Overheating, ventilation and noise are all important aspects of building design where standards and specifications should be raised to combat climate change and also improve the quality of life for residents.

We would like to see several guidance documents produced that work together to enable buildings to be designed and converted into residential use holistically. The Professional Practice Guidance: Planning and Noise for New Residential Development (ProPG) was developed and agreed by CIEH, IOA and ANC does this successfully.

Reasonable standards need to apply to dwellings being converted into residential use as well as new build dwellings, taking into account the health of the occupiers.

Building Regulations should not be too prescriptive where requirements that are too specific can contradict other policies and guidance documents as well as having unintended consequences. This includes being overly prescriptive on the maximum size of windows in Greater London. Whilst this should be one option of reducing overheating, other technologies and approaches should be used to achieve an outcome that is suitable to the specific project.

The proposed approaches could restrict or otherwise hinder innovative façade measures, such as the use of plenum windows, that could help to mitigate the effects of noise and overheating in medium and high noise exposure areas.

Minimising the risk of overheating should be a question of balance, having proper regard to all factors affecting health and quality of life. Prescriptive pass or fail criteria for overheating are not appropriate because these do not encourage a balanced approach.

Mechanical ventilation systems should also be considered in both high and medium noise areas, especially where there is significant air pollution present.

81. How should the Government address the overheating risk?
d) I have an alternative approach

Overheating is a significant problem and action is needed to tackle the risk of overheating, particularly in new development. Furthermore, every effort should be made to minimise or avoid carbon emissions and meet the UK's carbon targets. Overheating is however only one of a number of factors or conditions affecting the health and well-being of people whilst indoors. These include noise, ventilation, excessive cold, security, internal air quality, damp and mould growth, daylight and connectivity with the external environment.

A number of these factors are closely interrelated. For example, having to keep windows open to reduce indoor temperatures could result in adverse effects from noise in medium and high noise exposure areas. It is important therefore to consider all the factors associated with living conditions together in order to understand the overall effect on health and quality of life.

Factors affecting health, well-being and comfort are also closely related to the way in which people use buildings and this could also have significant implications in terms of heat conservation, energy use and carbon emissions. Therefore, all of these factors need to be considered together in order to address the challenges of climate change adaptation and mitigation.

We recommend that new dwellings should be designed:

- To protect and optimise overall health and quality of life of the occupants from all relevant factors and should avoid focussing on specific aspects of the built environment
- Based on evidence for the effects on health and quality of life

Within this context, measures contained in the Building Regulations should be aligned with other planning requirements and guidance for the design of dwellings, including the National Planning Policy Framework (NPPF), the Noise Policy Statement for England (NPSE), the National Planning Practice Guidance (NPPG) and the Professional Practice Guidance: Planning and Noise for New Residential Development (ProPG) and British Standards where applicable.

Measures should only be introduced into the Building Regulations where they can be standardised with other regulations and official guidance. It is also essential they do not have unintended consequences in relation to other policies and guidance, such as the Noise Policy Statement for England. It is important any changes form part of a system to consider the issue of housing design holistically. We do not believe the proposed Building Regulation changes set out in this consultation meet this test. Guidance for new homes, including planning and detailed design, would be a better approach. These should not be introduced into the Building Regulation regime unless it can be demonstrated that the measures will not have adverse consequences on other aspects of health and quality of life. Additionally,

any changes should not constrain good design through the planning, design and construction process.

82. Do you agree with the buildings that are in scope of this new part of the Building Regulations?

b) Yes, but they should be expanded to include all residential building types and extended to the conversion of existing buildings for residential use

This should include the conversion of existing buildings for residential purposes, from other uses. Whilst different standards may need to be applied to different situations to reflect the constraints associated with the conversion of existing buildings into dwellings, converted dwellings should be required to meet residential standards in full as far as possible. For example, it should be practical to apply shading requirements to conversions.

83. Do you agree that the division of England based on overheating risk detailed in paragraph 5.6.3 of this consultation document is correct?

a) Yes

The overheating risk should be based on evidence of the heat effect and should not preclude other areas if studies in future show similar urban heat island effects.

84. Do you agree with the categorisation of buildings into Group A and Group B as detailed in paragraph 5.6.5 of this consultation document?

a) Yes

85. Do you agree with the simplified method as a means of compliance with the proposed new requirement to reduce overheating risk?

a) No, the method should be more sophisticated

The simplified method appears to go too far, is inflexible and may have adverse consequences for health and quality of life from natural daylight, noise and other factors. Whilst open windows might reduce solar gain, this may not necessarily be effective at preventing overheating, especially in London. Recent Summers have shown that opening windows does not help in reducing indoor overheating.

The effects on other aspects of health and quality of life have not been sufficiently assessed or considered. Given the risks of unintended consequences, impacts on health and quality of life from all relevant factors should be assessed. We also suggest that a phased approach will be appropriate where there is a gradual tightening of the standards and where evidence collected after each phase of implementation supports further tightening of the standards.

For example, the benefits of minimising overheating risk are not outweighed by the dis-benefits on other aspects of health and comfort.

We are also concerned that the simplified method will constrain a good acoustic design process and good acoustic design solutions in medium and high noise areas. As such, the proposals are poorly aligned with the Professional Practice Guidance on Planning and Noise.

86. Do you agree with the maximum glazing area and shading standards for limiting solar gains in the simplified method as detailed in paragraphs 1.6 to 1.9 of the draft Overheating Approved Document?

b) No

We agree with the shading standards. However, there is serious concern that the proposed glazing areas go too far and will give rise to significant adverse effects on health and quality of life, without providing sound evidence supporting such a radical change. A more precautionary approach should be used until the effects on other aspects of health and quality of life have been assessed and considered and supported by evidence. Instead of being overly prescriptive on window sizes, this should be one option of reducing overheating, with other technologies and design approaches also being used to achieve an outcome that is suitable to the specific project. We would therefore advocate that a phased approach is used, where standards are progressively tightened over time but then only if any further tightening of standards is supported by evidence on health and quality of life.

87. Do you agree with the approach to removing excess heat in the simplified method as detailed in paragraphs 1.10 to 1.13 of the draft Overheating Approved Document?

b) No

Reliance on openable windows with minimum free areas could give rise to excessive noise and poor indoor air quality in areas exposed to medium and high levels of noise exposure and poor air quality. A more sophisticated approach will be required to ensure that the design is optimised to minimise the risk of overheating, noise, air quality and other factors affecting health and quality of life in areas with poor environments. A desktop analysis, assessing each application on its own merits is most likely to achieve the best outcomes. For example, where there are high noise levels and poor air quality – such as next to a busy road - having mechanical ventilation could be more appropriate than relying on open windows with minimum free areas.

More sophisticated approaches are needed to minimise the concentration of pollutants in poor air quality areas. The proposed approaches could restrict or otherwise hinder innovative façade measures, such as the use of plenum windows, that could help to mitigate the effects of noise and overheating in medium and high noise exposure areas.

88. Do you think that adequate levels of daylight will be provided and that homes will be acceptable to purchasers while meeting these proposed standards?

b) No

As explained earlier (see answer under question 86), we do not consider that enough evidence has been presented on the possible adverse consequences of the proposals and potentially negative effects on health and quality of life resulting from reduced daylight. Sufficient evidence should be obtained and reported on the overall consequences of these standards and proposals on health and quality of life.

Where there are serious overheating risks, these should be tackled in a variety of ways, using innovative and combinations of approaches appropriate to the specific locality, orientation and type of building.

Furthermore, there is a question as to whether new buildings with very small windows would be considered as high-quality homes by the occupiers and purchasers. These proposals do not seem to align with the ambitions of the National Design Code and Beautiful Buildings commission report, which the Government has committed to taking forward.

89. Do you agree with offering dynamic thermal analysis as a means of compliance with the proposed new requirement to reduce overheating risk?

b) Yes, but not as described in the draft Overheating Approved Document

We agree that dynamic thermal analysis provides a valuable means of reducing the risk of overheating. We also agree that the TM59 analysis approach is an appropriate method and encourages a consistent approach. We do not however agree that the TM59 pass/fail criteria represents an appropriate method. TM59 aims to prevent overheating rather than minimising the risk of overheating, on balance. In addition, TM59 and the maximum recommended temperatures are not strongly supported by evidence, as demonstrated by the evidence review contained in the Phase 1 report: Research into overheating in new homes, published as part of this consultation.

Minimising the risk of overheating should be a question of balance, having proper regard to all factors affecting health and quality of life. This is especially the case in medium and high noise exposure areas where there needs to be a balance between overheating and noise. The Professional Practice Guidance: Planning and Noise for New Residential Development provides a framework for achieving an appropriate balance between acoustics, overheating and other factors. The Building Regulations should be aligned with this guidance.

The Chief Medical Officer's report on all types of pollution has determined that "Noise stands second to poor air quality in terms of the burden of ill health caused by a single

pollutant".[1] The effects of noise on health and quality of life must therefore be taken into consideration when designing and building new dwellings.

It is very likely that the strength of evidence for the adverse effects of noise at levels of exposure frequently encountered in and around homes in the UK is greater than that for overheating. The World Health Organisation has found strong evidence that noise causes annoyance, sleep disturbance, impact on mental wellbeing and longer-term health effects. Weight should be given to acoustics, overheating and other factors affecting health and quality of life. Judgement is required because the evidence on health effects from overheating do not currently allow its effects to be quantified. This situation should change and the MHCLG should encourage or require post-occupancy monitoring to determine the health and quality of life implications of different design solutions. The instruments are already available to undertake such monitoring and so there is no excuse for not encouraging evidence-based designs and decision making.

There is serious concern that the proposed approaches will limit and constrain innovation and the adoption of solutions that work well elsewhere. For example, the innovative design solutions implemented as part of the HafenCity Project in Hamburg (see attached).

90. Please detail any information you have about the likelihood of occupants opening doors and windows at night in unoccupied rooms.

We do not have any information on this but there is a reasonable expectation that people will want to have doors and windows to bedrooms closed at night in an unoccupied bedroom, due to security risks.

91. Do you agree with the proposed acceptable strategies for shading and the removal of excess heat, when following the dynamic thermal analysis method, as found in Section 2 of the draft Overheating Approved Document?

a) Yes, I agree with both sets of acceptable strategies

92. Do you agree that the overheating standard should not account for the effect of curtains, blinds and tree cover?

a) Yes, curtains, blinds and tree cover should be excluded unless they can be secured as permanent solutions.

Relying on curtains and blinds is not a reliable control measure for reducing overheating. These methods help to keep rooms cooler but, unlike exterior shutters, curtains and blinds often trap heat inside the building. Furthermore, control measures outside the control of the occupant or the developer, such as trees, cannot be relied upon.

93. Do you agree that the building should be constructed to meet the overheating requirement without the need for mechanical cooling?

[1] https://www.gov.uk/government/publications/chief-medical-officer-annual-report-2017-health-impacts-of-all-pollution-what-do-we-know

Wherever it is practicable to do so, we agree that mechanical cooling should be prevented. We do not, however, agree that mechanical cooling should be prevented in all cases. There are circumstances where it might be justified, as set out in the ProPG. Mechanical cooling is used far too often when passive, rather than active solutions could achieve good acoustic design, minimise the risk of overheating and minimise risk from poor external air quality. Strong steps should therefore be taken to only allow mechanical cooling where it is has been shown conclusively to be necessary. i.e. as a measure of last resort, in exceptional circumstances to support good design objectives for health and quality of life overall. This approach to mechanical cooling should include high noise or air pollution exposure areas where there are particular constraints e.g. exposure to noise and/ or pollution on more than one façade of a building.

Prohibiting mechanical cooling in all circumstances could potentially prevent the development of a significant proportion of sites / areas exposed to high levels of noise and/ or pollution. The prevention of mechanical cooling should therefore be part of a strategic and coherent strategy and should be subject to a social impact assessment.

94. Do you agree with limiting noise in new residential buildings when the overheating strategy is in use, and the proposed guidance in Section 3 of the draft Overheating Approved Document?

We agree that buildings should be designed to minimise the adverse effects of noise inside dwellings at all times, including when the overheating strategy is in use. We would recommend that the ProPG provides appropriate guidance to be used for the design of residential developments.

We do **not** consider that the proposals in this consultation are compatible with the Noise Policy Statement for England or the ProPG. In particular, we do not agree that it is sufficient to prevent unacceptable levels of noise inside bedrooms. Rather, we would recommend that a Good Acoustic Design process is followed to minimise adverse effects and avoid significant adverse effects in and around homes as far as it is possible to do so, in line with the Government Policy Statement. The policy is not to simply prevent unacceptable levels of noise, as the consultation document seems to suggest.

We also disagree with the proposed noise standards and the proposal, there should be a distinction in standards when windows are open and when a mechanical system is in use to remove excess heat. The standards as proposed are too simplistic and could give rise to significant adverse effects from noise and cause serious sleep disturbance. Neither are they complete. We would strongly recommend that the proposals are aligned with ProPG and the internal noise levels guidelines given in Table 2 of the ProPG are adopted.

We do not agree that the Approved Document should refer to the Association of Noise Consultants' *Acoustics, ventilation and overheating residential design guide*. We would strongly recommend the approved document refers to Pro PG rather than Association of Noise Consultants' Acoustics, ventilation and overheating residential design guide. This is because we do not believe the later appropriately considers the effects of noise on sleep

quality. We are particularly concerned with the guidance given in Table 3.3 of the guide, which is based upon inappropriate evidence and effectively ignores the effects of noise on sleep quality. We would recommend that the Approved Document should refer to the ProPG instead. This is relevant guidance that has been agreed by the CIEH, IOA and the ANC and it is signposted in the Planning Policy practice guidance for Noise.

Question 95): Do you agree with minimising the ingress of external pollutants when the overheating strategy is in use, and that the external pollutants guidance in Approved Document F, volume 1: dwellings should be followed where practicable?

b) No

We do not believe the proposals are sufficient to minimise the risk of external pollutants. They do not represent a proper balance between the effects of overheating and adverse health effects from poor air quality.

For example, in high pollution areas it may be necessary to minimise or avoid opening windows on the most polluted aspects of the building and to use mechanical ventilation with air intakes on the least polluted locations of the building. If the air outside is poor but noise levels low, there still needs to be good air quality coming into the building, so options apart from open windows need to be considered in low noise areas too.