

AES Sustainability Consultants

Future Homes Standard & Part L 2021 Government response to
consultation

Impact Assessment based on Draft Approved Document [X] - Overheating
Consultation Version - January 2021



AES
Sustainability
Consultants

Part L 2021 - Overheating Consultation



Draft Guidance on [Overheating](#) proposed to form a new Approved Document

Two potential approaches to demonstrate compliance:

1. Simplified methodology

Risk-based assessment distinguishes between Greater London (Significant Risk) and remaining England (Moderate Risk). The specific requirements within these two location designations are then dictated by whether the dwelling falls into Category A or B:

Group A & B

The maximum amount of glazing allowable and requirements on openings free areas will vary depending on whether the dwelling falls into category A or B:

Group A - more than 2 glazed elements and ventilation on opposite sites. Applies to houses and some flats

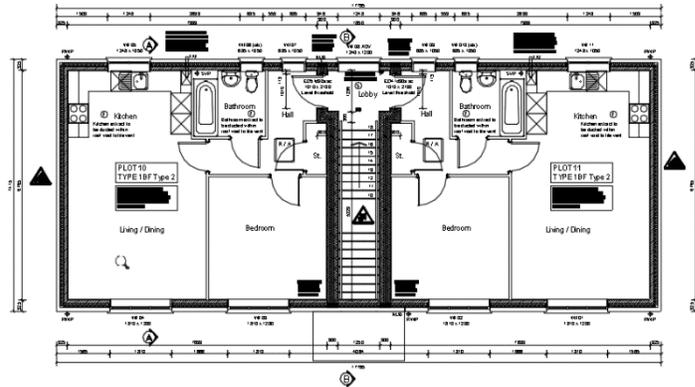
Group B - less than 2 glazed elements or no openings on opposite sites. Applies to most flats and common areas

2. Dynamic simulation

Alternatively, compliance can be proven with a dynamic simulation to demonstrate the design is meeting the parameters stated in CIBSE TM59. Following the dynamic route, comfort cooling is not prohibited but the design should meet the requirements without the need for mechanical ventilation

Group A

- i. More than two fabric elements
(thermal element or a whole façade of glazing which is exposed to the outside air or ground)
- ii. Openings on opposite facades, allowing for cross ventilation.

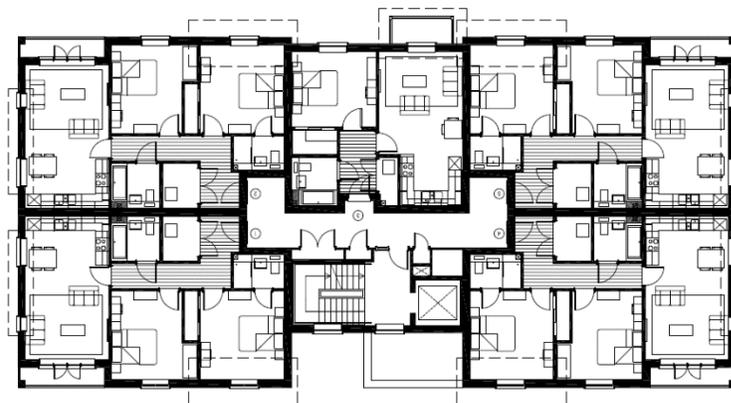


Most dwelling houses are within group A.

Apartments / Flats with central stairs (or similar design) would fall under Group A. Most apartments as currently designed will fall in the second category.

Group B

- i. Two or fewer fabric elements
(thermal element or a whole façade of glazing which is exposed to the outside air or ground)
- ii. Openings on facades which are **not** opposite.



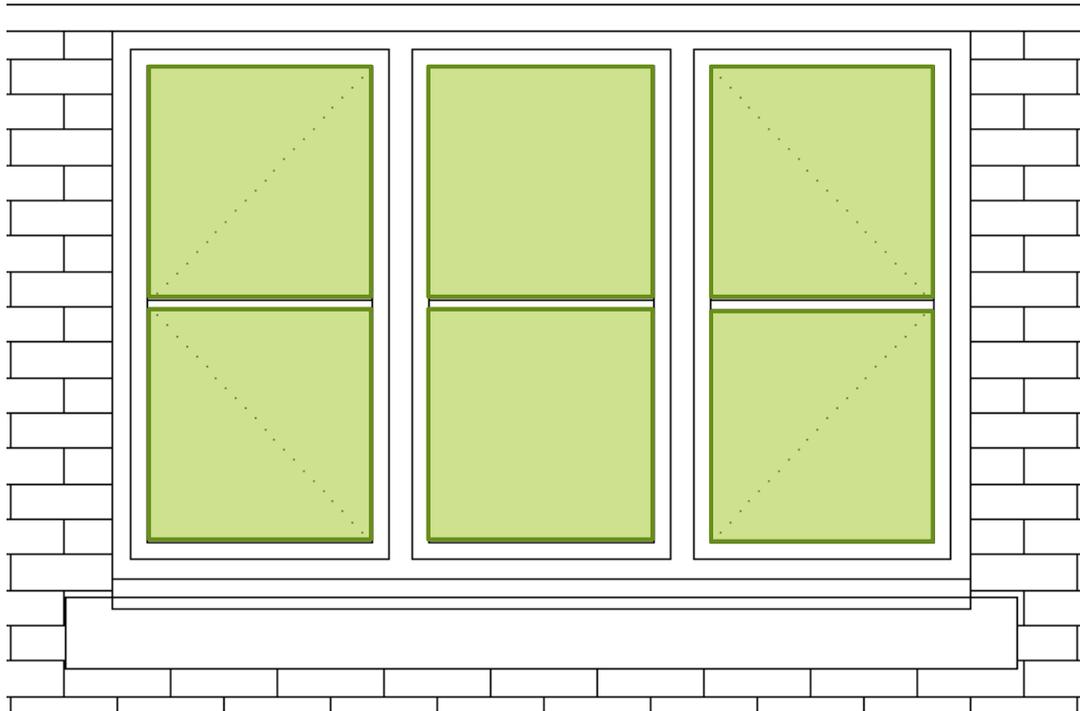
Generally includes flats and residential units in care homes or student hall of residences

Also generally includes common areas in buildings that contain flats and residential units such as communal corridors, stairwells and shared living spaces.

Key Terms

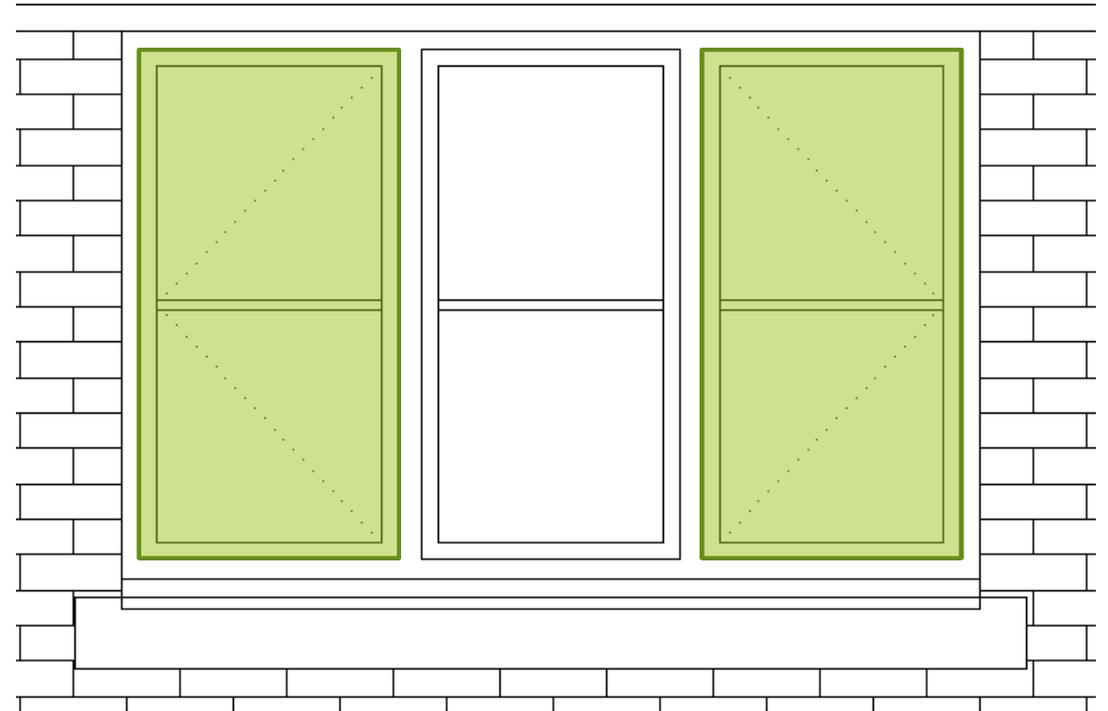
Approved document distinguishes between the Structural Opening, the Glazed Area and Free Openable Area.

Glazed Area



Glazing area is the area of transparent material, not including the window frame.

Free Openable Area



Free area is the geometric open area of a ventilator. Windows must open 60 degrees or the same equivalent needs to be provided.

Group A

- i. More than two thermal elements or a whole façade of glazing which is exposed to the outside air or ground
- ii. Openings on opposite facades, allowing for cross ventilation.

Minimising Solar Gains

England

Greater London

Maximum glazing area
21% of the floor area

Maximum glazing area
13% of the floor area

Shading (NE to NW via South)

No Shading

- a. External shutters with means of ventilation
- b. Glazing with a max. g-value of 0.4 and a high light transmittance of 0.7
- c. Overhangs with 50 degree altitude cut-off on due south-facing facades only

Glazing should be distributed so that either of the following applies:

- a. It is evenly distributed across all facades.
- b. There is more glazing on the north and east facades.

Removing Excess Heat

Glazing area is
<13% of the floor area

Glazing area is >13% of
the floor area

Minimum free area

Windows
open 60
degrees

Windows
don't open
60 degrees

Windows
open 60
degrees

Windows
don't open
60 degrees

12% of the
floor area

Same
effective
area as 60
degrees

Equal to the
glazing area

Same
effective
area as 60
degrees

It is likely that the **Minimum Free Area** provided will be larger than the maximum glazing required for **Minimising Solar Gains** when the area of the openable part of the window frame is considered.

Group B

- i. Two or fewer thermal elements or a whole façade of glazing which is exposed to the outside air or ground
- ii. Openings on facades which are not opposite.

Minimising Solar Gains

England

Maximum glazing area
21% of the floor area

Greater London

Maximum glazing area
15% of the floor area

Shading (NE to NW via South)

No Shading

- a. External shutters with means of ventilation
- b. Glazing with a max. g-value of 0.4 and a high light transmittance of 0.7
- c. Overhangs with 50 degree altitude cut-off on due south-facing facades only

Glazing should be distributed so that either of the following applies:

- a. It is evenly distributed across all facades.
- b. There is more glazing on the north and east facades.

Removing Excess Heat

Minimum free area

Windows open 60 degrees

Windows don't open 60 degrees

12% of the floor area

The glazing Area

Same effective area as 60 degrees

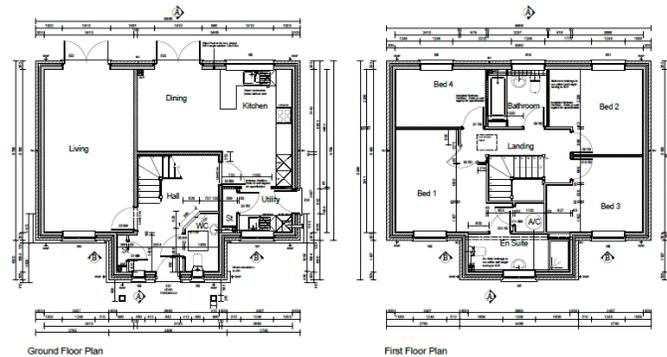
It is likely that the **Minimum Free Area** provided will be larger than the maximum glazing required for **Minimising Solar Gains** when the area of the openable part of the window frame is considered.



Group A

Example:
Detached House
with cross-
ventilation

- i. More than two fabric elements
(thermal element or a whole façade of glazing which is exposed to the outside air or ground)
- ii. Openings on opposite facades, allowing for cross ventilation.



Floor Area:
125.82 m²

Glazed Area:
14.93 m² (11.9%)

Free Area:
17.77 m²

Minimising Solar Gain

England

Greater London

21% = 26.42m²

13% = 16.35m²

14.93m² (Pass)

14.93m² (Pass)

Removing Excess Heat (All Regions)

Glazing <13% TFA

12% Floor Area = 15.10 m²

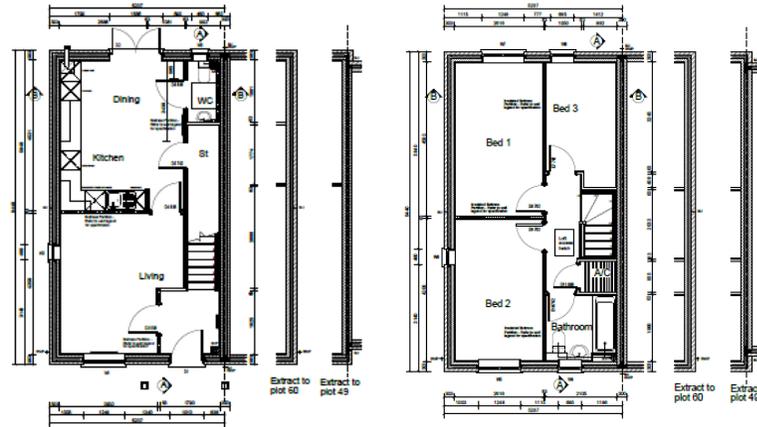
17.77m² (Pass)

Overall pass. Low risk for England and Greater London (g-value = 0.40 or other shading) as long as no additional requirements (noise, pollution, falling & entrapment or security) apply.

Group A

Example:
Terraced House
with cross-
ventilation

- i. More than two fabric elements
(thermal element or a whole façade of glazing which is exposed to the outside air or ground)
- ii. Openings on opposite facades, allowing for cross ventilation.



Floor Area:
83.16 m²

Glazed Area:
7.86 m² (9.5%)

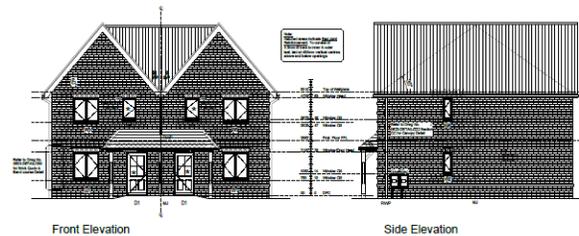
Free Area:
9.12 m²

Minimising Solar Gain

England	Greater London
21% = 17.46m ²	13% = 10.81m ²
7.86m ² (Pass)	7.86 m ² (Pass)

Removing Excess Heat (All Regions)

Glazing <13% TFA
12% Floor Area = 9.98 m ²
9.12m ² (Fail)



Front Elevation

Side Elevation



Rear Elevation

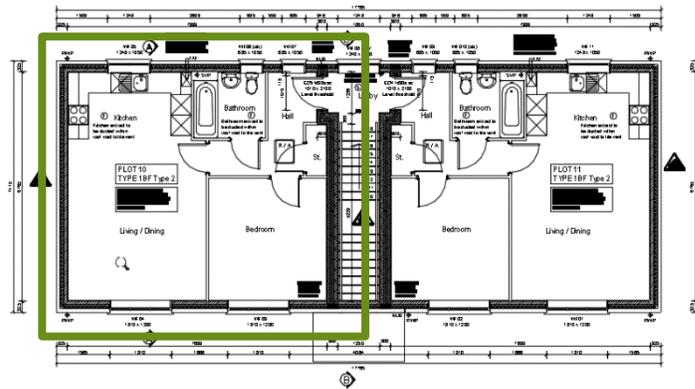
Side Elevation

Increase overall free area slightly to meet Excess Heat Threshold. For greater London (as defined by GLA), consider use of dynamic simulation instead. Mid-terrace variation would struggle due to no side windows.

Group A

Example:
Top Floor Flat
with cross-ventilation

- i. More than two fabric elements
(thermal element or a whole façade of glazing which is exposed to the outside air or ground)
- ii. Openings on opposite facades, allowing for cross ventilation.



Floor Area:
50.45 m²

Glazed Area:
4.59 m² (9.1%)

Free Area:
4.51 m²

Minimising Solar Gain

England

Greater London

21% = 10.60m²

13% = 6.56m²

4.59m² (Pass)

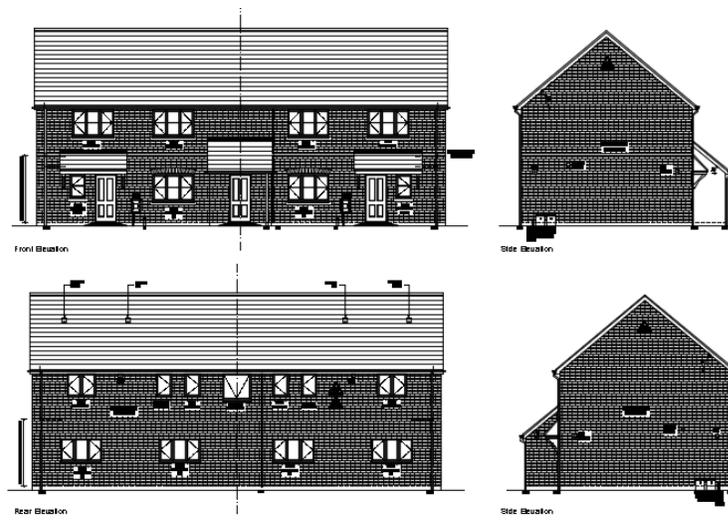
4.59 m² (Pass)

Removing Excess Heat (All Regions)

Glazing <13% TFA

12% Floor Area = 6.05 m²

4.51m² (Fail)

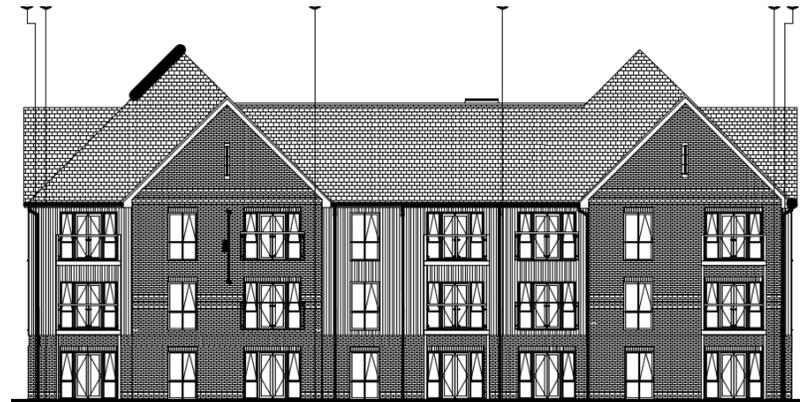


Increase openable windows (free area) by using currently fixed panes or increase overall free area. For greater London (as defined by GLA), consider use of dynamic simulation instead.

Group B

Top Floor Flat
without cross-
ventilation

- i. Two or fewer fabric elements
(thermal element or a whole façade of glazing which is exposed to the outside air or ground)
- ii. Openings on facades which are not opposite.



Floor Area:
51.46 m²

Glazed Area:
5.99 m² (11.6%)

Free Area:
4.28 m²

Minimising Solar Gain

England	Greater London
21% = 10.81m ²	15% = 7.72m ²
5.99m ² (Pass)	5.99 m ² (Pass)

Removing Excess Heat (All Regions)

12% Floor Area > 6.18 m²

4.28m² (Fail)

Increase openable windows (free area) by using currently fixed panes or increase overall free area. For greater London (as defined by GLA), consider use of dynamic simulation instead.

Corridors

Common areas are rooms and circulation spaces in buildings that contain more than one residential unit. Examples of these include, but are not limited to, corridors between dwellings and communal living rooms or kitchens.



Distribution pipework of communal heating systems can often contribute to overheating in unventilated corridors. Fans or a well thought through passive ventilation strategy is required to prevent heat building up in poorly ventilated areas.

If there are any pipes for communal heating or hot water in corridors, both of the following should apply.

- a. The rate of excess heat removal required should take into account the maximum heat gain from the pipes.
- b. The additional excess heat removal should be met through either or both of the following.
 - i. Non-glazed openings
 - ii. Mechanical ventilation.

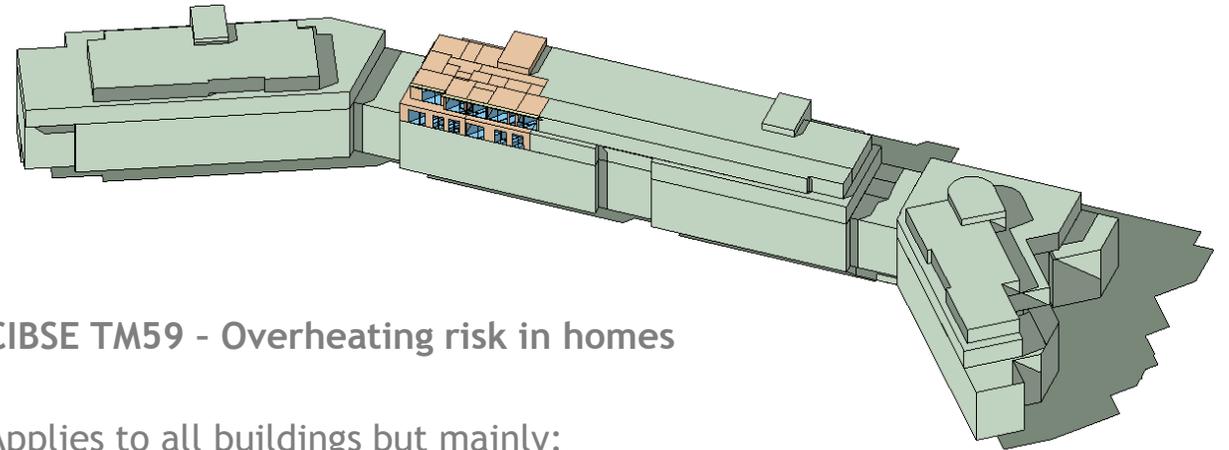


The **simplified or dynamic method** can be chosen to demonstrate compliance. Communal areas or corridors must be assessed individually and categorised. Category A or B does not apply to the whole building but individual area.

Dynamic Method

CIBSE TM59 - Overheating risk in homes

The dynamic method offers much more flexibility than the simplified method.



CIBSE TM59 - Overheating risk in homes

Applies to all buildings but mainly:

- Residential buildings with very high levels of insulation and air-tightness.
- Residential buildings with specific site conditions that mean the building is not well represented by the two locations in paragraphs 1.3, for example a city centre location that is not London.
- Residential buildings that are highly shaded by neighbouring properties, structures or landscape.

A report needs to be made available to building control. AES Sustainability Consultants use IES VE and can help to assess your house type range with the aim of achieving type approval.

Design methodology for the
assessment of overheating
risk in homes

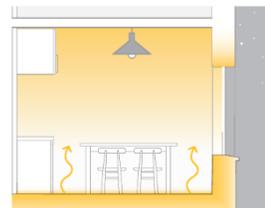
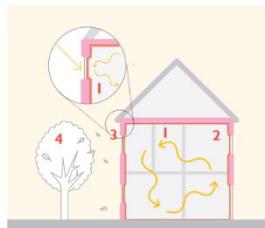
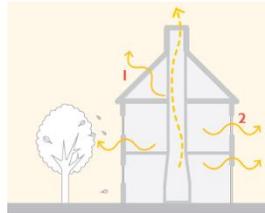


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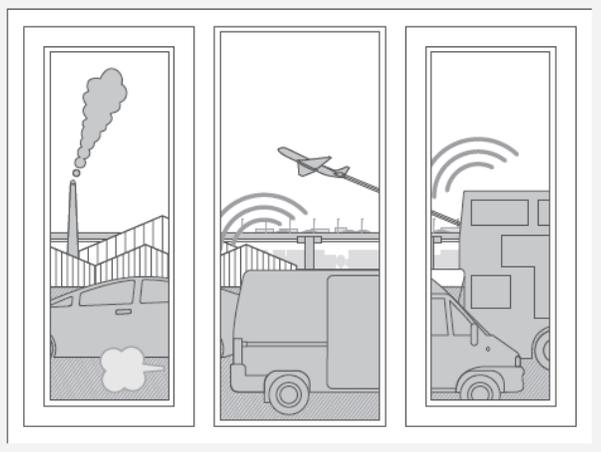
TM59: 2017



CIBSE TM59 & NHBC NF44 Understanding overheating.



Site Context



NHBC NF44 Understanding overheating.

Ensuring the overheating strategy is usable.

Every site is different and the context of the site needs to be taken into account. An overheating strategy is only successful if all external links are considered and documentation is provided which is easily understandable for the occupants.

Noise

Noise levels in bedrooms must be kept to a minimum when removing excess heat during the cooler night time hours (23:00 - 7:00).

Evidence on how noise has been considered needs to be provided to the building control body (local planning authorities may also consider noise to be an issue), actual measurements or modelling with the overheating mitigation strategy in use.

Pollution

Buildings located near to significant local pollution sources should be designed to minimise the intake of external air pollutants.

Security

Where openings, such as windows, are used in the overheating mitigation strategy, they should be made secure in order to resist physical attack by an opportunistic burglar during night time hours.

Protection from Falling / Entrapment

Where openings, such as windows, are used in the overheating mitigation strategy, the risk of occupants falling from height should be mitigated.

Louvered shutters, window railings and ventilation grills should not allow body parts to become trapped.

User Guide



Providing Information

Sufficient information about the overheating strategy and its maintenance requirements must be given to owners so that it can be used effectively. The information should be provided in a clear manner, for a non-technical audience.

The following information should be provided where relevant.

- a) The overall overheating risk reduction strategy. For example, appropriately sized windows that do not let in too much direct sun and therefore increase the internal temperature, but which open fully to allow cool air in. Or, roller shutters with ventilation louvres.
- b) The location of each element of the overheating mitigation strategy.
- c) Instructions to operate each element of the overheating mitigation strategy.
- d) The time of day that different parts of the strategy should be used. For example, the shutters should be used during the day and the windows opened only when it is cooler outside.
- e) The time of year the strategy should be used. For example, all summer from May to September or only in hot weather.
- f) Manufacturer's contact details.
- g) Location of controls and instructions for setting of controls e.g. timer controls.
- h) The location of sensors and how to recalibrate them.
- i) Cleaning and maintenance instructions.

Summary

Draft Guidance on Overheating

The draft guidance document was issued in January 2021, accompanying the consultation on the Future Buildings Standard, Part L and Part F of the Building Regulations for non domestic buildings and dwellings; and overheating in new residential buildings.

Main changes proposed and findings

- a) The guidance is intended to be a stand-alone Approved Document and has been disconnected from current methodology (Part L - Criterion 3). The document number is yet to be defined.
- b) The proposed **Simplified Method** is a risk based approach categorising building into **Group A or B** in line with their exposed elements and whether cross ventilation is present or not.
- c) A maximum target is set for each category for the amount of glazing (**Minimising Solar Gains**) and a minimum free area requirement is introduced (**Removing Excess Heat**). For buildings in Greater London, **Shading** needs to be applied across **North-East to North-West** facades.
- d) The minimum free area requirement has been identified as potentially the most difficult criteria to comply with. Dwellings with restricted openings (**Noise, Security, Falling From Height / Entrapment**) are especially at risk and may require an alternative approach to remove excess heat securely.
- e) **Communal Areas / Corridors** are included in the guidance. A passive or active ventilation strategy is required for each area on its own.
- f) The **Dynamic Simulation** option can always be chosen and is broadly in line with the requirements of TM 59
- g) The **Site Context** needs to be taken into consideration. Planning requirements, e.g. noise must be considered in the overall overheating strategy.
- h) **Detailed Evidence** is proposed to be provided to Building Control and the Home Owner.

