

Part O Guidance

Simplified Method

Part O applies to new residential buildings only. This includes residential dwellings, and institutional dwellings (e.g., student accommodation). Shared communal areas and common spaces containing more than one residential unit fall within the scope of Part O, as do live/work units.

The simplified method is not suitable for buildings with more than one residential unit which use a communal heating or hot water system with significant amounts of horizontal heating or hot water distribution pipework.

Key Definitions

Floor Area: the area of the residential unit measured to the internal face of the perimeter walls at each floor level.

Floor Area of the Room: the area of the room, measured to the internal face of the perimeter walls. Where a room serves more than one activity, e.g., open plan kitchen and living room, the area with the largest glazing area should be assessed and the room area calculated based on a room depth no greater than 4.5m from the glazed façade.

Free Area: the geometric open area of a ventilation opening. This area assumes a clear, sharp-edged orifice that would have a coefficient of discharge.

Equivalent Area: a measure of the aerodynamic performance of an opening. It is the area of a sharp-edged circular orifice through which air would pass at the same volume flow rate, under an identical applied pressure difference, as through the opening under consideration.

Cross-ventilation: the ability to ventilate using openings on opposite façades of a dwelling. Having openings on façades that are not opposite is not allowing cross-ventilation, e.g. in a corner flat.

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

Calculations

There are 2 calculations included in a simplified method assessment:

1. Limiting solar gains
2. Minimum free areas

Limiting Solar Gains

The first stage of an overheating assessment is determining whether the dwelling is considered to be in a high or moderate risk area by using the following table C1.

Postcodes that are not included in table C1 are classified as moderate risk.

Next, you must determine if the dwelling is cross-ventilated or not.

Table C1 Overheating risk at postcode area level in the high risk part of London

CR4	E17	EC3R	KT6	N22	SE8	SE27	SW11	TW10	W1F	W12
CR7	E18	EC3V	KT7	NW1	SE9	SE28	SW12	TW11	W1G	W13
E1	E20	EC4A	KT8	NW2	SE10	SW1A	SW13	TW12	W1H	W14
E1W	EC1A	EC4M	IG11	NW3	SE11	SW1E	SW14	TW13	W1J	WC1A
E2	EC1M	EC4N	N1	NW5	SE12	SW1H	SW15	TW14	W1K	WC1B
E3	EC1N	EC4R	N1C	NW6	SE13	SW1P	SW16	TW15	W1S	WC1E
E4	EC1R	EC4V	N2	NW8	SE14	SW1V	SW17	TW19	W1T	WC1H
E5	EC1V	EC4Y	N4	NW10	SE15	SW1W	SW18	UB1	W1U	WC1N
E6	EC1Y	HA0	N5	NW11	SE16	SW1X	SW19	UB2	W1W	WC1R
E7	EC2A	HA9	N6	RM8	SE17	SW1Y	SW20	UB3	W2	WC1V
E8	EC2M	IG1	N7	RM9	SE18	SW2	TW1	UB4	W3	WC1X
E9	EC2N	IG2	N8	RM10	SE19	SW3	TW2	UB5	W4	WC2A
E10	EC2P	IG3	N9	SE1	SE20	SW4	TW3	UB6	W5	WC2B
E11	EC2R	IG4	N13	SE2	SE21	SW5	TW4	UB7	W6	WC2E
E12	EC2V	KT1	N15	SE3	SE22	SW6	TW5	UB8	W7	WC2H
E13	EC2Y	KT2	N16	SE4	SE23	SW7	TW6	UB11	W8	WC2N
E14	EC3A	KT3	N17	SE5	SE24	SW8	TW7	W1B	W9	WC2R
E15	EC3M	KT4	N18	SE6	SE25	SW9	TW8	W1C	W10	
E16	EC3N	KT5	N19	SE7	SE26	SW10	TW9	W1D	W11	

To limit solar gains, all of the following standards should be followed:

Table 1.1 Limiting solar gains for buildings or parts of buildings with cross-ventilation⁽¹⁾				
	High risk location		Moderate risk location	
Largest glazed façade orientation	Maximum area of glazing (% floor area)	Maximum area of glazing in the most glazed room (% floor area of room)	Maximum area of glazing (% floor area)	Maximum area of glazing in the most glazed room (% floor area of room)
North	15	37	18	37
East	18	37	18	37
South	15	22	15	30
West	18	37	11	22
NOTE:				
1. Floor area and floor area of room are as defined in Appendix A.				

Table 1.2 Limiting solar gains for buildings or parts of buildings without cross-ventilation⁽¹⁾				
	High risk location		Moderate risk location	
Largest glazed façade orientation	Maximum area of glazing (% floor area)	Maximum area of glazing in the most glazed room (% floor area of room)	Maximum area of glazing (% floor area)	Maximum area of glazing in the most glazed room (% floor area of room)
North	15	26	18	26
East	11	18	18	26
South	11	11	15	15
West	11	18	11	11
NOTE:				
1. Floor area and floor area of room are as defined in Appendix A.				

The maximum glazing area of the building or part of the building given in Table 1.1 or Table 1.2. This should be determined using the orientation of the façade that has the largest area of glazing.

As you can see, the orientation of the largest glazed façade has a large impact on the amount of glazing allowed. If the % area of glazing of either the total floor dwelling or of the floor area of the most glazed room exceeds the limits set out above, the simplified method calculation will fail.

Design changes, e.g., reducing the amount of glazing, can be made to rectify this. If design changes are not possible, a TM59 calculation will be required.

Dwellings in High Risk Locations

In addition to following the maximum glazed areas, high risk dwellings should be provided with shading for glazed areas between compass points north-east and north-west via the south. Shading should be provided by the following means:

- External shutters with means of ventilation
- Glazing with a maximum g-value of 0.4 and a minimum light transmittance of 0.7
- Overhangs with 50 degrees altitude cut-off on due south-facing facades only

Minimum Free Areas

Dwellings should equal or exceed the minimum free areas in the tables below:

Table 1.3 Minimum free areas for buildings or parts of buildings with cross-ventilation

	High risk location	Moderate risk location
Total minimum free area ⁽¹⁾	The greater of the following: a. 6% of the floor area ⁽²⁾ b. 70% of the glazing area ⁽³⁾	The greater of the following: a. 9% of the floor area ⁽²⁾ b. 55% of the glazing area ⁽³⁾
Bedroom minimum free area	13% of the floor area of the room ⁽⁴⁾	4% of the floor area of the room ⁽⁴⁾
NOTES: 1. The total minimum free area is the free area for the whole dwellinghouse, residential unit, shared communal room or common space, including any bedrooms. 2. 'Floor area' is a key term. See Appendix A. 3. 'Glazing area' is a key term. See Appendix A. 4. 'Floor area of the room' is a key term. See Appendix A.		

Table 1.4 Minimum free areas for buildings or parts of buildings without cross-ventilation

	High risk location	Moderate risk location
Total minimum free area ⁽¹⁾	The greater of the following: a. 10% of the floor area ⁽²⁾ b. 95% of the glazing area ⁽³⁾	The greater of the following: a. 12% of the floor area ⁽²⁾ b. 80% of the glazing area ⁽³⁾
Bedroom minimum free area	13% of the floor area of the room ⁽⁴⁾	4% of the floor area of the room ⁽⁴⁾
NOTES: 1. The total minimum free area is the free area for the whole dwellinghouse, residential unit, shared communal room or common space, including any bedrooms. 2. 'Floor area' is a key term. See Appendix A. 3. 'Glazing area' is a key term. See Appendix A. 4. 'Floor area of the room' is a key term. See Appendix A.		

The equivalent area is calculated using the height, width, and opening angle of each openable window. The table below is an example of the table used to determine equivalent area. The table used depends on the opening angle of the glazing.

Table D7 Equivalent area of a window with an opening angle of $\alpha = 70^\circ$

		Opening width, w (m)				
		0.5	0.75	1	1.25	1.5
Opening height, h (m)	0.5	0.21	0.34	0.46	0.61	0.73
	0.75	0.32	0.48	0.69	0.86	1.03
	1	0.41	0.64	0.85	1.15	1.37
	1.25	0.51	0.80	1.07	1.33	1.72
	1.5	0.62	0.93	1.28	1.60	1.92
	1.75	0.72	1.08	1.49	1.87	2.24
	2	0.82	1.23	1.65	2.13	2.56
	2.25	0.93	1.39	1.85	2.40	2.88
	2.5	1.03	1.54	2.06	2.57	3.20
	2.75	1.13	1.70	2.26	2.83	3.52
	3	1.23	1.85	2.47	3.09	3.70

The minimum free areas outlined in the table above must be met in both the dwelling as a whole, and each individual bedroom.

There is no mention of rooflights/roof windows in Approved Document Part O, therefore, they aren't included in the calculation. This means that bedrooms in roof rooms no windows, only roof lights, impossible to pass the simplified method.

Again, if the minimum free areas are not met, design changes e.g., making unopenable windows openable, can be made. If these design changes are not feasible, a TM59 calculation would be required.

Security

When determining the free area available for ventilation during sleeping hours, only the proportion of openings can be opened securely should be considered to provide useful ventilation. This particularly applied in the following locations, where openings may be vulnerable to intrusion by a casual or opportunistic burglar:

- Ground floor bedrooms
- Easily accessible bedrooms

Open windows or doors can be made secure by using any of the following:

- Fixed or lockable louvred shutters
- Fixed or lockable grilles or railings

TM59 Calculation

A TM59 – dynamic thermal modelling calculation – is a more detailed calculation.

TM59 provides a single criterion for assessing comfort and overheating in mechanically ventilated buildings:

- The modelling demonstrates that the building design and services strategy can deliver thermal comfort levels in occupied spaces in accordance with the criteria set out in CIBSE design methodology for the assessment of overheating risk in homes.
- The software used to carry out the simulation at the detailed design stage provides full dynamic thermal analysis.

Criteria

Criteria for Homes Predominantly Naturally Ventilated

Compliance is based on passing both of the following criteria:

1. For living rooms, kitchens, and bedrooms: the number of hours during which t_{int} is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3% of occupied hours
2. For bedrooms only: to guarantee comfort during the sleeping hours, the operative temperature in the bedroom from 10pm to 7am shall not exceed 26°C for more than 1% of annual hours. (Note: 1% of the annual hours between 22:00 and 7:00 for bedrooms is 32 hours, so 33 or more hours above 26°C will be recorded as a fail)

Criteria for Homes Predominantly Mechanically Ventilated

For homes with restricted window openings, the CIBSE fixed temperature test must be followed. i.e., all occupied rooms should not exceed an operative temperature of 26°C for more than 3% of the annual occupied hours.

Important Notes

Internal blinds cannot be included in TM59 calculations.

Mechanical Cooling cannot be included in TM59 calculations.

Our TM59 reports will include recommendations on how to meet compliance should the dwelling fail. The following methods are suitable recommendations for overheating mitigation:

- External shading e.g., overhangs
- Mechanical ventilation system
- Solar shading products
- Increasing ventilation via increased openable glazing areas

(multiple mitigation methods may be required)