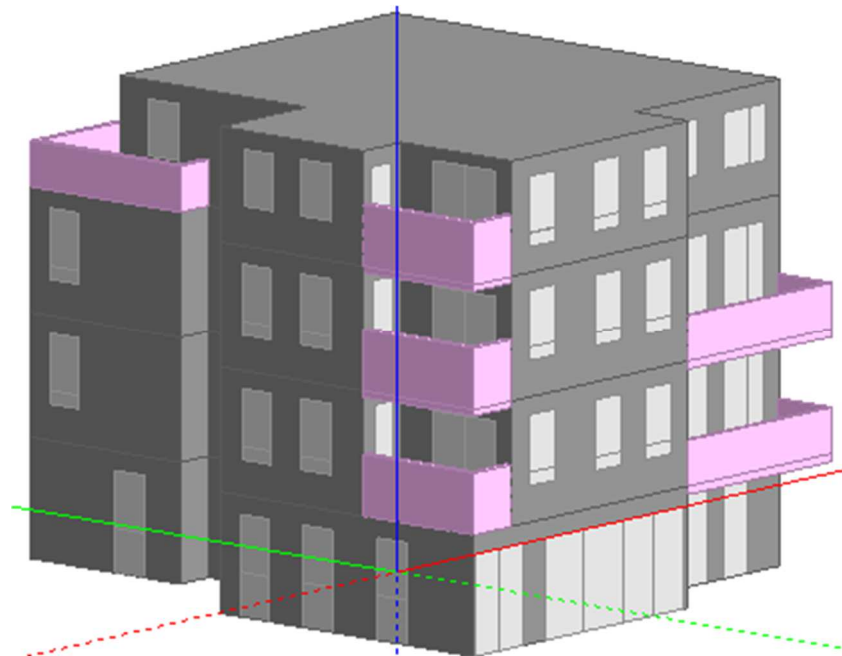


Part O Over Heating Building Regulations

Jansons Road, London, N15 4JP
Rev 03



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Jansons Road, London, N15 4JP
5th February 2026



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1: Introduction

Overheating risk has been a growing concern amongst the domestic design, construction and provider community for at least a decade. Domestic overheating has not always been a problem in the UK but climate change, increased urbanisation, construction of high rise apartment blocks and winter energy efficiency measures have all contributed in the amplification of high internal temperatures. Homes that overheat cause significant discomfort and stress to the occupants and can ultimately lead to litigation and costly mitigation measures for the owners/developers. Yet overheating is subjective — the point at which 'hot' becomes 'too hot' will vary from person to person and depend upon a variety of factors. Whilst this means that not all occupants will be satisfied all the time and that, in a heatwave, it may still be very warm in a naturally ventilated dwelling, there should be a reasonable limit set on how much warmer a dwelling can be inside than outside. There should also be a standard that precludes the worst levels of overheating and enables designers to find cost effective options to limit overheating risk whilst also delivering all the other aspects occupants look for in their homes (e.g. daylight, insulation, view etc). The methodology described here attempts to define that threshold.

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2: Regulation

The approved document O

The approved documents set out what, in ordinary circumstances, may be accepted as one way to comply with the Building Regulations. It remains the responsibility of those designing or undertaking building work to assess, on a case-by-case basis, whether specific circumstances require additional or alternative measures to achieve compliance with the regulatory requirements. There are interactions between many of the requirements of the Building Regulations and the following paragraphs provide guidance on some key interactions.

Interaction with Part B

This approved document, Approved Document O, gives guidance on window openings for removing excess heat from residential buildings. Approved Document B gives guidance on the size of escape windows. Where escape windows are provided to comply with Approved Document B, any extra glazing will impact the risk of overheating.

Interaction with Part F

This approved document, Approved Document O, includes guidance on providing means of removing excess heat from residential buildings. Where openings are used, the amount of ventilation for removing excess heat is likely to be higher than the **purge ventilation** required for Part F. The higher amount of ventilation applies – see Section 1 or Section 2 of this approved document, depending on the method of compliance.

Interaction with Part J

Ventilation fans might cause combustion gases to spill from open-flued appliances and fill the room instead of going up the flue or chimney. This can occur even if the combustion appliance and fan are in separate rooms. The guidance in Approved Document J should be followed when installing and testing ventilation appliances and combustion appliances must operate safely whether or not fans are running.

Interaction with Part L

Solar gains in winter can reduce the amount of space heating required to be delivered by the heating system. Reducing summer overheating by limiting **glazing areas** will impact winter solar gains and therefore increase the need for space heating. Poorly insulated pipework, particularly in community heating schemes, can be a major contributor to overheating. Control of heat losses from pipework is dealt with under Part L of the Building Regulations and the guidance in Approved Document L should be followed.

Interaction with Part K and Part M

Where manual controls are provided, they should be within reasonable reach of the occupants, to comply with Approved Documents K and M.

Interaction with Part K

This approved document, Approved Document O, gives guidance on increased levels of protection from falling from openings compared to Part K.

Interaction with Part Q

This approved document, Approved Document O, gives guidance on security considerations when providing large openings for removing excess heat. The locking systems of windows and doors should also conform to guidance given in Approved Document Q on the security of doors and windows in dwellings.

3: Ensuring the overheating mitigation strategy is Usable

The standards in this section may mean that the standards of the simplified method cannot be met. For example, if external noise is an issue, it is unlikely that windows would be opened by an occupant and therefore the minimum free areas of the simplified method cannot be met. In such cases, **dynamic thermal modelling** should be used.

Noise

In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (11pm to 7am).

Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.

- a. 40dB LAeq,T, averaged over 8 hours (between 11pm and 7am).
- b. 55dB LAFmax, more than 10 times a night (between 11pm and 7am).

Where in-situ noise measurements are used as evidence that these limits are not exceeded, measurements should be taken in accordance with the Association of Noise Consultants' *Measurement of Sound Levels in Buildings* with the overheating mitigation strategy in use.

NOTE: Guidance on reducing the passage of external noise into buildings can be found in the *National Model Design Code: Part 2 – Guidance Notes* (MHCLG, 2021) and the Association of Noise Consultants' *Acoustics, Ventilation and Overheating: Residential Design Guide* (2020).

Pollution

Buildings located near to significant local pollution sources should be designed to minimise the intake of external air pollutants. Guidance is given in Section 2 of Approved Document F, Volume 1: *Dwellings*

Security

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

- a. Ground floor bedrooms.
 - b. **Easily accessible** bedrooms.
- Open windows or doors can be made secure by using any of the following.
- a. Fixed or lockable **louvred** shutters.
 - b. Fixed or lockable window grilles or railings.

Protection from falling

Openings which are intended to be open for long periods to reduce overheating risk might pose a higher risk of falls from height. Only the proportion of openings which can be opened with a very low risk of occupants falling from height should be considered to form part of the overheating mitigation strategy. Openings that can be opened wider than 100mm may form part of the overheating mitigation strategy where they meet all of the following conditions.

- a. Window handles on windows that open outwards are not more than 650mm from the inside face of the wall when the window is at its maximum openable angle.
- b. **Guarding** meets the minimum standards in Table 3.1.
- c. **Guarding** does not allow children to easily climb it. For example, horizontal bars should generally be avoided.

Guarding for large openings could include, but is not limited to, either of the following.

- a. Shutters with a child-proof lock.
- b. Fixed **guarding**.

Protection from entrapment

Louvered shutters, window railings and ventilation grilles should not allow body parts to become trapped. They should comply with all of the following.

- a. Not allow the passage of a 100mm diameter sphere.
- b. Any hole which allows the passage of an 8mm diameter rod should also allow the passage of a 25mm diameter rod. Such holes should not taper in a way that allows finger entrapment.
- c. Any looped cords must be fitted with child safety devices

It is the responsibility of the designer / architect / developer to consider all other parts of building regulations, and ensuring the overheating mitigation strategy is usable and must be taken into account.

4.0 Summary

The report shows the results of the TM59 overheating analysis in accordance with part O building regulation, the assessment has been completed on the new dwelling at Land at Fairways, Toff Road, Bourn, the results show that the dwelling complies with the TM59 overheating assessment. Within the report design assumptions have been made these are required to be confirmed they are suitable / applicable to the dwelling and any variation from these assumptions could result in the dwelling failing the assessment.

4.1 :Criteria for homes predominantly naturally ventilated

Compliance is based on passing *both* of the following two criteria:

- (a) *For living rooms, kitchens, and bedrooms:* the number of hours during which DT is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 percent of occupied hours. (CIBSE TM59 Criterion 1: *Hours of exceedance*).
- (b) *For bedrooms only:* to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26 °C for more than 1% of annual hours. (*Note:* 1% of the annual hours between 22:00 and 07:00 for bedrooms is 32 hours, so 33 or more hours above 26 °C will be recorded as a fail)

4.2 Criteria for homes predominantly mechanically ventilated

For homes with restricted windows openings- all occupied rooms should not exceed an operative temperature of 26°C for more than 3% of the annual occupied hours.

4.3: Criteria for Corridors

The overheating test for corridors should be based on the number of annual hours for which an operative temperature of 28 °C is exceeded. Whilst there is no mandatory target, if an operative temperature of 28 °C is exceeded for more than 3% of total annual hours, this should be flagged as a significant risk within the report.

4.4 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 annual hours

4.5: Weather files

Development has been carried out on the latest CIBSE year (dsy 1) weather files and be required to pass using the DSY1 file most appropriate to the site location, for the 2020s, high emissions, 50% percentile scenario.

5.0: Design Assumptions

The applied U – values shown below have been applied to the simulation, these have been checked with Part L building regulations to ensure they also comply.

Element	U – Value Element	G value
Windows	1.00	0.25
Floor	0.10	
Walls	0.16	
Roof	0.10	
Wall to Stairs	0.25	

5.1 : MVHR flow rates

Flat 1	Location	L/s	Flat 2	Location	L/S	Flat 3	Location	L/s	Flat 4	Location	L/s
	KLD	10		KLD	10		KLD	10		KLD	10
	Bed 1	10		Bed 1	20		Bed 1	40		Bed 1	20
	Bed 2	30		Bed 2	20		Bath	8		Bed 2	20
	Bed 3	20		Bed 3	60					Bed 3	60
	Bath	8		Bath	8					Bath	8
Flat 5	Location	L/s	Flat 6	Location	L/s	Flat 7	Location	L/s			
	KLD	10		KLD	10		KLD	10			
	Bed 1	40		Bed 1	30		Bed 1	70			
	Bath	8		Bed 2	20		Bath	8			
				Bath	8						

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5.2 : internal heat gains

NA

5.3 : Windows and Door openings - Recommendations

Windows in each room be controlled separately and modelled as open when both the internal dry bulb temperature exceeds 22 °C and the room is occupied.

The free area of the windows has been calculated using appendix D in part O building regulations. See elevations for angle opening for the calculated free area aperture.

The angle of opening are to be confirm by the architect / developer

Windows will cill heights less than 1.1m require guarding.

Ground floor openings : applied restricted opening schedule : closed during the evening.

Internal doors applied full open unrestricted apart from the bedroom which have restricted openings.

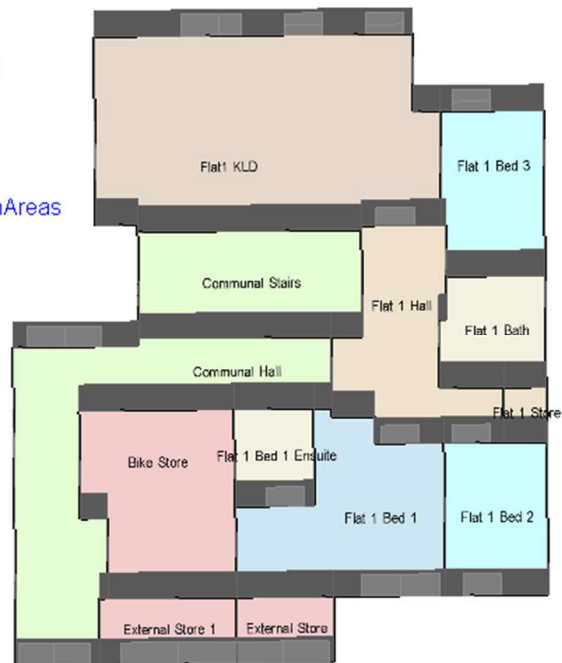
Windows with cill heights lower than 600mm on the ground floor require guarding

Infill panels required as indicated on the elevations  showing where infill panels are required to reduce solar gain

Patio doors to be altered on the balconies in flats 2,3,4,5 7 7 to a single opening door and a windows to accommodate the heat pump location - see elevations

6: Floor Plans

- Domestic Bathroom
- <None>
- TM59_3-BedLivingKitchen
- TM59_SingleBedroom
- TM59_CirculationAreas
- TM59_DoubleBedroom
- TM59_CommonCirculationAreas



- Domestic Bathroom
- TM59_CirculationAreas
- TM59_1-BedLivingKitchen
- TM59_DoubleBedroom
- TM59_CommonCirculationAreas
- TM59_3-BedLivingKitchen
- Domestic Circulation
- TM59_SingleBedroom



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- Domestic Bathroom
- TM59_CirculationAreas
- TM59_1-BedLivingKitchen
- TM59_DoubleBedroom
- TM59_CommonCirculationAreas
- TM59_3-BedLivingKitchen
- Domestic Circulation
- TM59_SingleBedroom



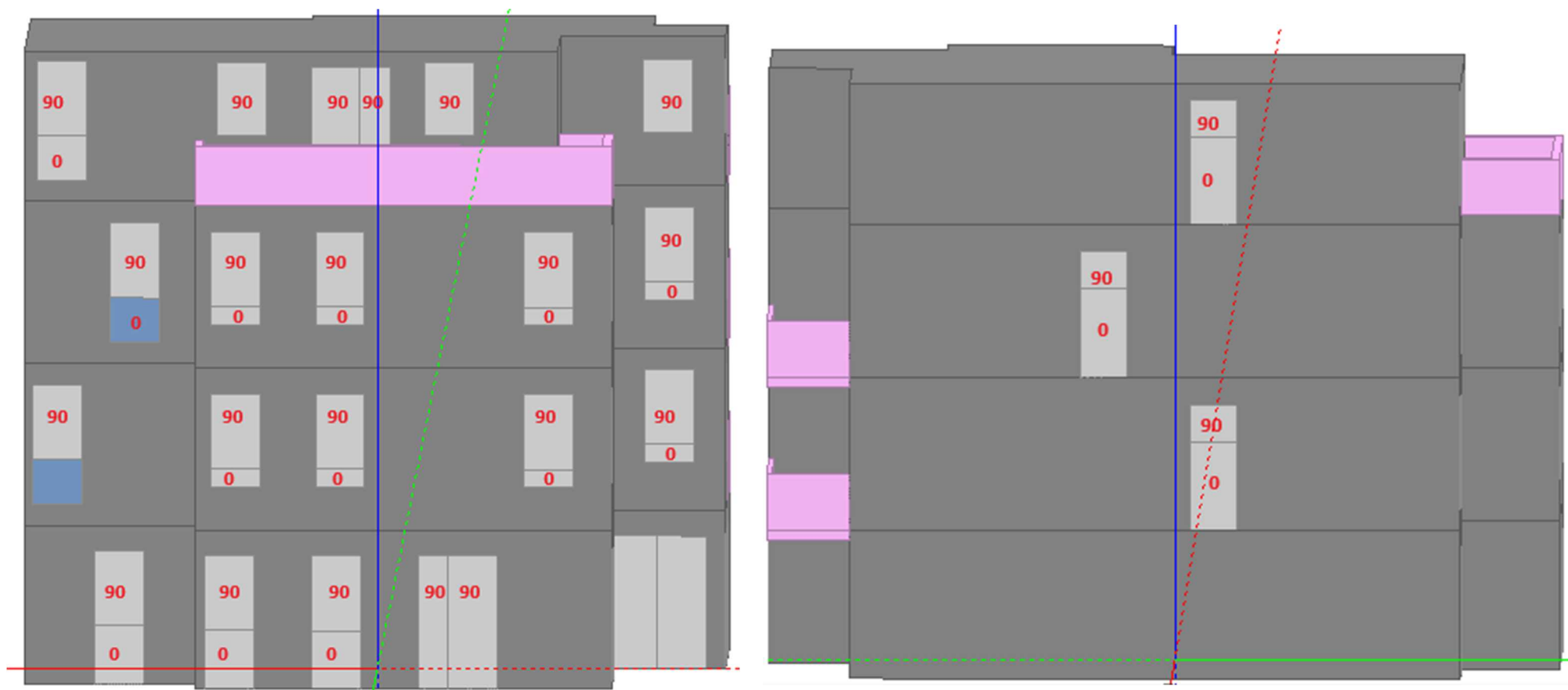
- TM59_1-BedLivingKitchen
- TM59_SingleBedroom
- TM59_DoubleBedroom
- Domestic Bathroom
- TM59_CirculationAreas
- TM59_2-BedLivingKitchen
- TM59_CommonCirculationAreas



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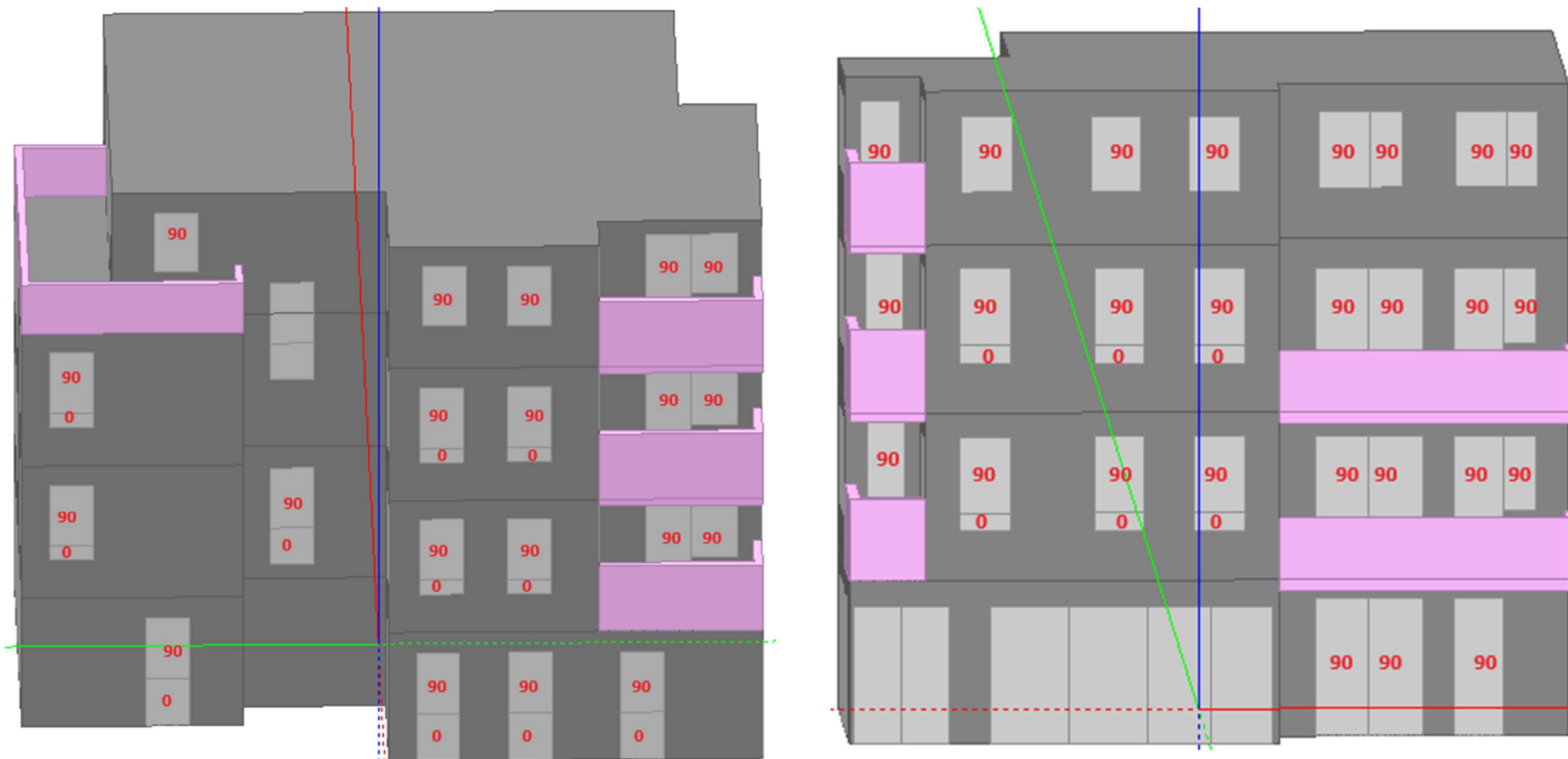


7:Elevations: window angel openings



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Results: Natural - DSY 1 2020 high 50

Naturally ventilated Mechanically ventilated Comidors

Criteria for predominantly naturally ventilated homes

Block	Zone	Criterion A (%)	Criterion B (hr)	Pass/Fail
FLOOR00	FLAT1BED1	0.26	68.00	Fail
FLOOR00	FLAT1BED2	0.42	58.67	Fail
FLOOR00	FLAT1BED3	0.37	62.33	Fail
FLOOR00	FLAT1KLD	0.88	N/A	Pass
FLOOR01	FLAT2BED1	0.33	25.33	Pass
FLOOR01	FLAT2BED2	0.23	27.83	Pass
FLOOR01	FLAT2BED3	0.23	31.67	Pass
FLOOR01	FLAT2KLD	0.74	N/A	Pass
FLOOR01	FLAT3BED1	0.38	31.00	Pass
FLOOR01	FLAT3KLD	0.99	N/A	Pass
FLOOR02	FLAT4BED1	0.37	25.00	Pass
FLOOR02	FLAT4BED2	0.31	27.17	Pass
FLOOR02	FLAT4BED3	0.26	31.00	Pass
FLOOR02	FLAT4KLD	0.83	N/A	Pass
FLOOR02	FLAT5BED1	0.42	31.33	Pass
FLOOR02	FLAT5KLD	1.04	N/A	Pass
FLOOR03	FLAT6BED1	0.47	31.50	Pass
FLOOR03	FLAT6BED2	0.47	28.33	Pass
FLOOR03	FLAT6KLD	0.93	N/A	Pass
FLOOR03	FLAT7BED1	0.60	32.00	Pass
FLOOR03	FLAT7KLD	1.78	N/A	Pass

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Results: Mechanically ventilated – DSY 1 2020 high 50

Showing compliance for easily assessable rooms

Naturally ventilated

Mechanically ventilated

Coridors

Criteria for predominantly mechanically ventilated homes

	Block	Zone	% Hours Exceeded	Pass/Fail
▶	FLOOR00	FLAT1BED1	2.60	Pass
	FLOOR00	FLAT1BED2	2.91	Pass
	FLOOR00	FLAT1BED3	2.90	Pass

Results : showing Corridors – DSY 1 2020 high 50

Naturally ventilated

Mechanically ventilated

Coridors

Criteria for corridors

	Block	Zone	% Hours Exceeded	Pass/Fail
▶	FLOOR00	COMMUNALHALL	0.93	Pass
	FLOOR00	COMMUNALSTAIRS	0.32	Pass
	FLOOR00	FLAT1HALL	0.69	Pass
	FLOOR00	FLAT1STORE	0.67	Pass
	FLOOR01	FLAT2HALL	0.38	Pass
	FLOOR01	FLAT3HALL	0.20	Pass
	FLOOR01	FLAT3HALLQ1	0.45	Pass
	FLOOR02	FLAT4HALL	0.45	Pass
	FLOOR02	FLAT5HALL	0.42	Pass
	FLOOR02	FLAT5HALL1	0.28	Pass
	FLOOR03	COMMUNALSTAIRS	0.45	Pass
	FLOOR03	FLAT6HALL	0.48	Pass
	FLOOR03	FLAT6STORE	0.32	Pass
	FLOOR03	FLAT6STORE1	0.30	Pass
	FLOOR03	FLAT7HALL	0.50	Pass
	FLOOR03	FLAT7STORE	0.26	Pass

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Table 2 Occupancy and equipment gain descriptions

Unit/ room type	Occupancy	Equipment load
Studio	2 people at 70% gains from 11 pm to 8 am 2 people at 100% gains from 8 am to 11 pm	Peak load of 450 W from 6 pm to 8 pm*, 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room/kitchen	1 person from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
1-bedroom apartment: living room	1 person at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
1-bedroom apartment: kitchen	1 person at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
2-bedroom apartment: living room/kitchen	2 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200 W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
2-bedroom apartment: living room	2 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
2-bedroom apartment: kitchen	2 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm Base load of 50 W for the rest of the day
3-bedroom apartment: living room/kitchen	3 people from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 450 W from 6 pm to 8 pm 200W from 8 pm to 10 pm 110 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 85 W for the rest of the day
3-bedroom apartment: living room	3 people at 75% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 150 W from 6 pm to 10 pm 60 W from 9 am to 6 pm and from 10 pm to 12 pm Base load of 35 W for the rest of the day
3-bedroom apartment: kitchen	3 people at 25% gains from 9 am to 10 pm; room is unoccupied for the rest of the day	Peak load of 300 W from 6 pm to 8 pm base load of 50 W for the rest of the day
Double bedroom	2 people at 70% gains from 11 pm to 8 am 2 people at full gains from 8 am to 9 am and from 10 pm to 11 pm 1 person at full gains in the bedroom from 9 am to 10 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during the sleeping hours
Single bedroom (too small to accommodate double bed)	1 person at 70% gains from 11 pm to 8 am 1 person at full gains from 8 am to 11 pm	Peak load of 80 W from 8 am to 11 pm Base load of 10 W during sleeping hours
Communal corridors	Assumed to be zero	Pipework heat loss only; see section 3.1 above