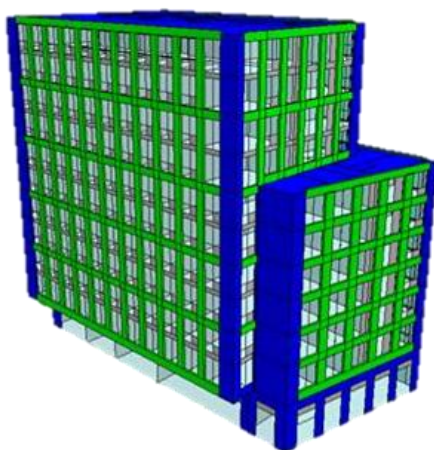




**Management
and
Engineering
Services Ltd**



**GAMECOCK
BOOTH STREET WEST STUDENT ACCOMMODATION
MANCHESTER

OVERHEATING ASSESSMENT**

Project No: B2798
Date: March 2022
Client: Curlew Alternatives Eighth Property LLP
Document Reference: BSW-AMES-00-XX-RP-ME-FI40-0003

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Revision Record:

Version No	Issue Date	Revisions
1	11/03/2022	Initial Issue
2	04/05/2022	Updated to change from natural ventilation to MVHR.
3	01/06/2023	Update to reflect inclusion of Part O/ TM59
4	10/07/2023	Updated U-Values
5	29/08/2023	Updated to reflect change in number of rooms

Quality Assurance Approvals:

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1.00 INTRODUCTION

1.01 Scope of Study

Amber Management & Engineering Services were appointed by Curlew Alternatives Eighth Property LLP to undertake an overheating risk assessment on a sample of areas within the proposed student accommodation development at Booth Street West in Manchester.

This report assesses the overheating risk of a sample of areas within the proposed development. Spaces were selected on the basis of their perceived vulnerability to overheating and to give a representative range of area types from across the development.

The intention is that this study helps inform and verify the design of the proposals, thereby providing the basis for mitigating overheating risk and producing a building that provides comfortable environmental conditions for occupants.

It is important to note that with any modelling exercise there are assumptions and approximations that have to be made. As far as possible, details of all assumptions and approximations are supplied within the report. These were predominantly informed by information provided by the Client and should be reviewed carefully.

All results are based on the output from computer modelling software and should be taken as an indication of the likely final situation, but these conditions cannot be guaranteed. Compliance with the assessment criteria does not mean that spaces will be comfortable all year round, but rather that the overheating risk is limited to an acceptable level.

2.00 ASSESSMENT CRITERIA

2.01 General

The building is to be constructed to the energy performance standards set out under Approved Document Part L 2021. As the development is residential in nature this therefore means that compliance with Approved Document Part O – Overheating is mandatory.

Part O largely follows the requirements of CIBSE Technical Manual 59 – ‘*Design methodology for the assessment of overheating risk in homes*’. This is the industry recognised standard for assessing the risk of overheating within residential buildings.

To meet the requirements of Part O / CIBSE TM59 the following criteria must be met:

In kitchens, living rooms and bedrooms: Between 1st May and 30th September the number of occupied hours during which the indoor operative temperature (T_{op}) exceeds the threshold comfort temperature (T_{max}) by 10°C or more must be no more than 3% of occupied hours. This is the same as criterion one from CIBSE TM52.

In bedrooms only: The indoor operative temperature (T_{op}) in the bedroom from 22:00 to 07:00 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).

In predominantly mechanically ventilated spaces with restricted window openings: All occupied rooms should not exceed an indoor operative temperature (T_{op}) of 26°C for more than 3% of the annual occupied hours.

In corridors: If the indoor operative temperature (T_{op}) exceeds 28°C for more than 3% of total annual hours this should be highlighted as a significant risk, although this is not a mandatory compliance requirement.

The operating temperature (T_{op}) is calculated using the formula:

$$T_{op} = \frac{T_a \sqrt{10v} + T_r}{1 + \sqrt{10v}}$$

Where:

T_a = indoor air temperature (°C)

T_r = mean radiant temperature (°C)

v = Air speed (m/s)

The threshold comfort temperature (T_{max}) is calculated using the following formula:

$$T_{max} = 0.33T_{rm} + 21.8$$

Where T_{rm} = exponentially weighted running mean of the daily mean outdoor air temperature

For an explanation of how both T_{rm} and the weighted exceedance for compliance with criterion two are calculated please see appendix 1.

As all occupied rooms within the development will be predominantly mechanically ventilated assessment criterion 3 above will be applicable.

3.00 3D ANALYSIS MODEL

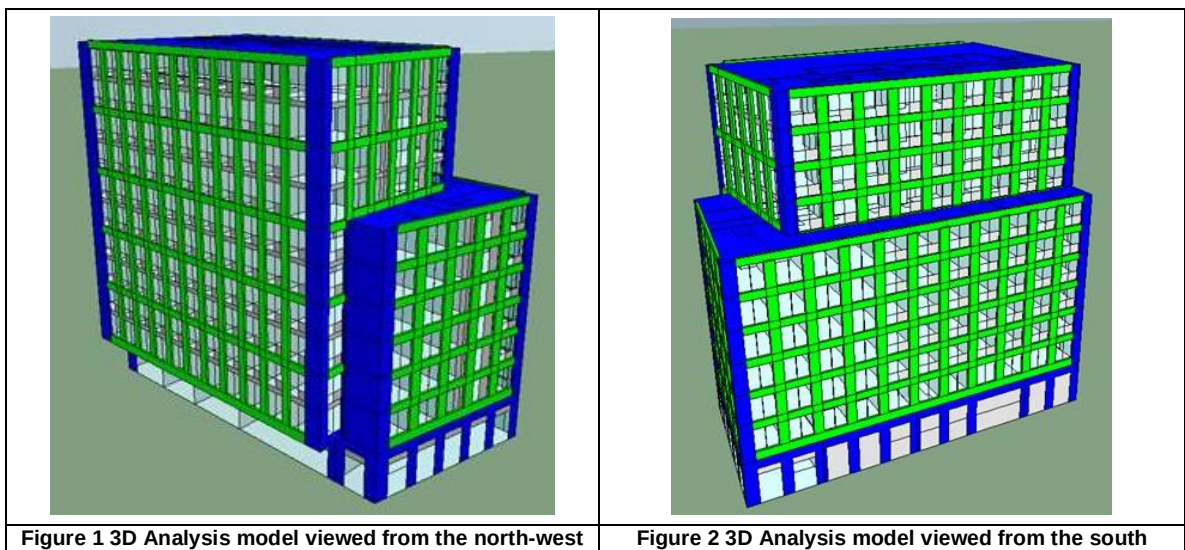
3.01 General

A 3D model of the development has been constructed within IES Virtual Environment software using the ModelIT tool. IES VE is a dynamic simulation modelling software, which has been selected and applied in accordance with CIBSE AM11.

3.02 Geometry

Figures 1 and 2 below show the three-dimensional analysis model that has been generated for the proposed development. The model has been developed using the drawn information produced by SimpsonHaugh and Partners during the project updates throughout 2023.

The massing of the adjacent Cooper House has also been included in the assessment model as accurately as possible based on the limited geometric information available.



3.03 Building Fabric

The thermal performance of the building fabric has been based, wherever possible, on that provided to Amber by the project design team. It has been necessary to make some assumptions in the absence of design information, all of which should be reviewed for suitability. This is summarised in Table 3.1 below.

Building Element	g-value/ light transmittance	U-value (W/m ² .K)	Construction
External Wall (Generally)	n/a	0.15	Brick slips with insulation behind and plasterboard lining internally
Opaque Glazed Wall	n/a	0.32	Opaque glazing with insulation behind and plasterboard lining internally
Basement Walls	n/a	-	Reinforced concrete wall with blockwork internally
Ground Floor	n/a	0.14	Ground bearing slab with solid insulation and floor finish over
Exposed Floor	n/a	0.14	Concrete floor slab with insulation and external finish below
Roof	n/a	0.12	Concrete deck with insulation and finish over

			9 ^h floor consists of lightweight roof construction
Glazing (inc. Glazed Doors)	0.40 / 0.71	1.4	Double glazing with solar control
Louvered Panels and Doors	n/a	2.2	Insulated louvered panels

Table 3.1 Building Fabric details and u-values

Internal walls to circulation cores have been modelled as reinforced concrete with plasterboard lining to both sides. Wide internal walls (>215mm) have been modelled as blockwork with plasterboard lining to both sides. All narrow walls (<215mm) have been modelled as uninsulated stud partitions.

Internal floors are modelled as screeded reinforced concrete deck with void and plasterboard ceiling below.

Opaque glazing is assumed to all lower panels of glazing/perforated arrangements, as indicated in external wall drawings from SimpsonHaugh coded G251. It has also been applied to all opaque areas of façade at 9th floor level.

The perforated panels in front of openings have been modelled as transparent construction with solar and visible light transmittance of 0.45. This is to represent the 45% free area.

The construction build ups used were obtained from the information contained on the architectural drawings and information relayed via email. These shall be finalised once architects details are concluded and products confirmed by the main contractor.

Heat transfer between assessed spaces and adjacent non-assessed internal spaces is considered adiabatic (i.e. zero heat transfer).

4.00 PART O THERMAL COMFORT ASSESSMENT

4.01 Climate Data

IES VE software uses CIBSE weather files to assess the thermal comfort levels during simulations. There are generally two types of weather file, a TRY (Test Reference Year) file and a DSY (Design Summer Year) file. Weather files are available for 12no separate locations throughout the UK. The weather file that has the closest representation to the site climate should be applied to the model.

The DSY is a single continuous year rather than a composite one made up from average months. The DSY is used for overheating analysis during the summer months. There are three types of DSY file:

- DSY1: Moderately warm summer
- DSY2: Short, intense warm spell
- DSY3: Long, less intense warm spell

CIBSE TM59 states that the most appropriate DSY1 weather file for the 2020s, high emissions, 50% percentile scenario should be used to undertake the analysis. Therefore, the weather file that has been selected for this AD Part O assessment is the CIBSE database for Manchester. This weather file best represents the weather conditions at the site.

Solar gains are calculated automatically by the modelling software based on the geometry, location and orientation of the building, the solar transmission factor of the glazing and the solar angles. The IES VE SunCast module is used to calculate solar gains, with the results file utilised by the dynamic simulation model.

4.02 Mechanical Ventilation

Continuous MVHR background mechanical ventilation is proposed to the majority of occupied spaces. Due to acoustic restrictions, the purge ventilation rates shall also be met by MVHR and are dictated by the requirements of TM59. Details of the proposed rates are given in the table 4.1 below:

The MVHR units will include a 100% summer bypass mode to avoid recovering heat when conditions are warm. For the purpose of the thermal comfort modelling it is assumed that summer bypass is activated and that fresh air is provided to the space at ambient external air temperature. Mechanical ventilation rates within each of the room types assessed are as follows, with boost ventilation rates in operation when the internal temperature exceeds 20°C:

Room Type	Mechanical ventilation supply rate	
	Normal (l/s)	Boost (ac/h)
Apartment Bedrooms	13	4
Apartment Kitchens	21	5 (unless stated otherwise)
Studio	21	5 (unless stated otherwise)

Table 4.1 Mechanical Ventilation Rates

Ventilation is provided by mechanical means, with a background rate supplemented with an enhanced rate when the internal dry bulb temperature reaches a prescribed threshold.

The enhanced ventilation rate is controlled on temperature. The air turnover rate starts to increase from the background level once an internal temperature of 20°C is reached, with the maximum enhanced rate of 4-6 air changes per hour achieved.

TM59 stipulates that “mechanical boost ventilation (included for occasional use with louder fan noise) should not be assumed in the overheating risk analysis”. It is therefore paramount that the enhanced ventilation rate stipulated is achieved in a manner that allows it to operate during concerted periods of time without causing any physical or acoustic discomfort to occupants.

All supply air is assumed to be provided at external ambient temperature. All ventilation systems are also modelled as operating with automatic full summer bypass to avoid the recovery of heat from the extract airstream when not desirable.

4.03 Openable Windows

The ventilation strategy within the development relies on local mechanical ventilation with heat recovery or mechanical extract as a worst case scenario. As the detailed design progresses, the utilisation of openable windows will be further considered as it provides a more passive solution but also may impact on occupant's environment.

All perimeter rooms shall be provided with manually operated natural ventilators. Due to acoustic limitations these have not been considered as an acceptable means to control thermal comfort and therefore have not been considered in the TM59 calculations. The ventilators will be available for occupants to use should they wish when external noise conditions allow.

4.04 Occupancy Gains

Table 4.2 below shows the occupancy gains and profiles within each room type that have been included within the thermal model. These have been based upon the requirements set out within CIBSE TM59, table 4.2.

Room Type	Occupancy	Gains (W/person)		Profile
	People	Sensible	Latent	
Apartment Bedrooms	1	75.0	55.0	70% gain 23:00 to 08:00 100% gain 08:00 to 23:00 (modified from TM59 to assume occupancy all day for study)
Studio	1	75.0	55.0	
Apartment kitchens	3	75.0	55.0	25% gain from 09:00 to 22:00 Unoccupied at other times of day

Table 4.2 Occupancy gains within each occupied room type

4.05 Lighting Gains

As required within section 5.2 of CIBSE TM59, lighting gains are assumed to be 2W/m² throughout the building. Lighting is assumed to be switched on in all habitable rooms and corridors between the hours of 18:00 and 23:00. In corridors, as PIR control will be utilised for lighting this gain has been modelled as zero in accordance with the guidance within section 5.2 of TM59.

4.06 Equipment / Pipework Gains

Equipment gains have been included within the model for each occupied space as shown in table 4.2 below. These figures are taken from table 2 within section 6 of CIBSE TM59.

Within corridors, the average heat loss from DHW supply and return pipework has been calculated to be 7.2W/m, or 14.4W/m for both supply and return combined. As a 'typical' corridor is 2.5m wide, the gain to corridors from pipework has been calculated to be 5.76W/m². As the overheating risk occurs outside of the heating season it is assumed that there are no internal gains from space heating flow and return pipework.

Room Type	Peak Gain (W)	Profile
Apartment Bedrooms	80	80W from 08:00 to 23:00 10W gain at all other times
Studio	450	450W from 18:00 to 20:00 200W from 20:00 to 22:00 110W from 09:00 to 18:00 and 22:00 to 24:00 85W at all other times
Apartment kitchens	300	300W from 18:00 to 20:00 50W at all other times

Table 4.3 Equipment gains within each occupied room type

4.07 Infiltration

An infiltration rate of 0.15 air changes per hour (ACH) at 3m/s wind speed has been assumed, based on the targeted air permeability rate of 3m³/hr/m² at 50Pa. This is derived from empirical data published in CIBSE Guide A Table 4.23 and the rule of thumb of 20:1.

5.00 AD PART O THERMAL COMFORT ASSESSMENT RESULTS

As all occupied rooms within the development rely primarily on mechanical ventilation systems only the third criterion from section 2.0 is applicable, with the fourth criterion applicable to corridors. Therefore, where T_{op} in occupied areas is below 26°C for no more than 3% of occupied hours these areas are considered to pass the Part O overheating check.

Referring to table 2 within CIBSE TM59 the annual occupied hours for each room type have been determined as follows:

- Apartment bedrooms and studios – 24 hours a day x 365 days a year = 8,760 hours
- Apartment kitchens – 13 hours a day x 365 days a year = 4,745 hours

Therefore, the maximum permissible hours where T_{op} exceeds 26°C or each space is as follows:

- Apartment bedrooms and studios – 8,760 hours x 3% = 263 hours
- Apartment kitchens – 4,745 hours x 3% = 142 hours

As a total of 146no rooms have been assessed the results are too numerous to be shown within the main body of this report. These have instead been shown within appendix 2. These results clearly show that each of the occupied spaces assessed has less than 3% of annual occupied hours where T_{op} exceeds 26°C.

6.00 CONCLUSION

The proposed Fusion student accommodation development at Booth Street West, Manchester has been assessed for thermal comfort against Approved Document Part O / CIBSE TM59 criteria. As the occupied rooms are mechanically ventilated the criterion for '*homes predominantly mechanically ventilated*' is applicable, meaning T_{op} must not exceed 26°C for more than 3% of annual occupied hours in any of the occupied rooms.

The thermal analysis completed confirms that the apartment bedrooms, studios, and apartment kitchens within the building all comply with the CIBSE TM59 criterion utilising the proposed fabric and building services strategy.

The results of this analysis therefore confirm that there is no risk of overheating within occupied areas.

7.00 APPENDIX 1 - CIBSE TM52 DETAILS

7.01 Definition of T_{rm}

Box 2: Exponentially weighted running mean of the daily mean outdoor air temperature

The adaptive model of thermal comfort has found that the comfort temperature inside free-running buildings is related to the outdoor air temperature. The measure of outdoor temperature has often been the monthly mean. The comfort temperature is related to the thermal history of the subject with more recent experiences being more influential. This makes the exponentially weighted running mean an attractive measure for past temperatures. Such running means had previously shown their usefulness in describing changes in clothing in response to changing temperatures (Humphreys, 1979). The exponentially weighted running mean temperature, T_{rm} , for any day is expressed in the series:

$$T_{rm} = (1 - \alpha) (T_{od-1} + \alpha T_{od-2} + \alpha^2 T_{od-3} \dots) \quad (2.1)$$

where α is a constant (<1) and T_{od-1} , T_{od-2} , etc. are the daily mean temperatures for yesterday, the day before, and so on.

(Note that 'today's' daily mean temperature is not used because it remains unknown until the end of the day.) Since $\alpha < 1$, this series puts greater weight on the temperature for days closer to the present. The larger the value of α , the more important the past experience will be. For a series of days the value of T_{rm} for any day

can be simply calculated from the value of the running mean and of the mean outdoor temperature for the previous day (T_{rm-1} and T_{od-1}):

$$T_{rm} = (1 - \alpha) T_{od-1} + \alpha T_{rm-1} \quad (2.2)$$

This makes the running mean very simple to use once a starting value has been established. The optimal value of α to use in calculating the changes in indoor comfort temperature has been investigated using the data from comfort surveys conducted throughout Europe. The value of T_{rm} calculated using equation 2.1 correlates best with T_c when $\alpha = 0.8$.

Where an extensive run of days is not available, BS EN 15251 (BSI, 2007) gives an approximate calculation method using the mean temperatures for the last seven days ($\alpha = 0.8$):

$$T_{rm} = (T_{od-1} + 0.8 T_{od-2} + 0.6 T_{od-3} + 0.5 T_{od-4} + 0.4 T_{od-5} + 0.3 T_{od-6} + 0.2 T_{od-7}) / 3.8 \quad (2.3)$$

This approximate value can also be used to 'start off' a longer run of T_{rm} .

Figure 3 Taken from CIBSE TM52, page 7

7.02 Definition of Weighted Exceedance

(b) Criterion 2: Daily weighted exceedance (W_e)

To allow for the severity of overheating the weighted exceedance (W_e) shall be less than or equal to 6 in any one day where:

$$\begin{aligned} W_e &= (\sum h_e) \times WF \\ &= (h_{e0} \times 0) + (h_{e1} \times 1) + (h_{e2} \times 2) + (h_{e3} \times 3) \end{aligned} \quad (10)$$

where the weighting factor $WF = 0$ if $\Delta T \leq 0$, otherwise $WF = \Delta T$, and h_{ey} is the time (h) when $WF = y$.

Thus suppose we have a room where the temperature is simulated or monitored at half-hourly intervals over 8 occupied hours, so we have 16 readings, ten of them where ΔT is zero or negative ($WF = 0$), three readings where $\Delta T = 1$ ($WF = 1$), two where $\Delta T = 2$ ($WF = 2$) and one where $\Delta T = 3$ ($WF = 3$) then:

Figure 4 Taken from CIBSE TM52, page 14

8.00 APPENDIX 2 – PART O / CIBSE TM59 RESULTS BY ROOM TYPE

8.01 Apartment Rooms

Location	> 26.00	Max permissible hours	% of annual occupied hours $T_{op} > 26^{\circ}\text{C}$
01 Accessible Cluster Bedroom	40	263	0.5%
01 Cluster Bedroom	107	263	1.2%
01 Cluster Bedroom	105	263	1.2%
01 Cluster Bedroom	106	263	1.2%
01 Cluster Bedroom	106	263	1.2%
01 Cluster Bedroom	106	263	1.2%
01 Cluster Bedroom	106	263	1.2%
01 Cluster Bedroom	106	263	1.2%
01 Cluster Bedroom	84	263	1.0%
01 Cluster Bedroom	105	263	1.2%
02 Accessible Cluster Bedroom	39	263	0.4%
02 Cluster Bedroom	86	263	1.0%
02 Cluster Bedroom	110	263	1.3%
02 Cluster Bedroom	110	263	1.3%
02 Cluster Bedroom	111	263	1.3%
02 Cluster Bedroom	102	263	1.2%
02 Cluster Bedroom	110	263	1.3%
02 Cluster Bedroom	110	263	1.3%
02 Cluster Bedroom	110	263	1.3%
02 Cluster Bedroom	110	263	1.3%
03 Accessible Cluster Bedroom	38	263	0.4%
03 Cluster Bedroom	86	263	1.0%
03 Cluster Bedroom	110	263	1.3%
03 Cluster Bedroom	109	263	1.2%
03 Cluster Bedroom	105	263	1.2%
03 Cluster Bedroom	109	263	1.2%
03 Cluster Bedroom	111	263	1.3%
03 Cluster Bedroom	110	263	1.3%
03 Cluster Bedroom	110	263	1.3%
03 Cluster Bedroom	109	263	1.2%
04 Accessible Cluster Bedroom	39	263	0.4%
04 Cluster Bedroom	87	263	1.0%
04 Cluster Bedroom	111	263	1.3%
04 Cluster Bedroom	110	263	1.3%
04 Cluster Bedroom	110	263	1.3%
04 Cluster Bedroom	112	263	1.3%

04 Cluster Bedroom	110	263	1.3%
04 Cluster Bedroom	110	263	1.3%
04 Cluster Bedroom	108	263	1.2%
04 Cluster Bedroom	110	263	1.3%
05 Accessible Cluster Bedroom	38	263	0.4%
05 Cluster Bedroom	109	263	1.2%
05 Cluster Bedroom	109	263	1.2%
05 Cluster Bedroom	87	263	1.0%
05 Cluster Bedroom	111	263	1.3%
05 Cluster Bedroom	106	263	1.2%
05 Cluster Bedroom	110	263	1.3%
05 Cluster Bedroom	110	263	1.3%
05 Cluster Bedroom	111	263	1.3%
05 Cluster Bedroom	109	263	1.2%
06 Accessible Cluster Bedroom	39	263	0.4%
06 Cluster Bedroom	111	263	1.3%
06 Cluster Bedroom	90	263	1.0%
06 Cluster Bedroom	113	263	1.3%
06 Cluster Bedroom	113	263	1.3%
06 Cluster Bedroom	111	263	1.3%
06 Cluster Bedroom	113	263	1.3%
06 Cluster Bedroom	115	263	1.3%
06 Cluster Bedroom	111	263	1.3%
06 Cluster Bedroom	109	263	1.2%
07 Cluster Bedroom	112	263	1.3%
07 Cluster Bedroom	114	263	1.3%
07 Cluster Bedroom	114	263	1.3%
07 Cluster Bedroom	114	263	1.3%
07 Cluster Bedroom	114	263	1.3%
07 Cluster Bedroom	114	263	1.3%
07 Cluster Bedroom	114	263	1.3%
07 Cluster Bedroom	116	263	1.3%
07 Cluster Bedroom	129	263	1.5%
07 Cluster Bedroom	91	263	1.0%
08 Cluster Bedroom	115	263	1.3%
08 Cluster Bedroom	115	263	1.3%
08 Cluster Bedroom	118	263	1.3%
08 Cluster Bedroom	113	263	1.3%
08 Cluster Bedroom	132	263	1.5%
08 Cluster Bedroom	115	263	1.3%
08 Cluster Bedroom	115	263	1.3%
08 Cluster Bedroom	90	263	1.0%
08 Cluster Bedroom	115	263	1.3%
09 Cluster Bedroom	99	263	1.1%
09 Cluster Bedroom	97	263	1.1%

09 Cluster Bedroom	99	263	1.1%
09 Cluster Bedroom	81	263	0.9%
09 Cluster Bedroom	120	263	1.4%
09 Cluster Bedroom	99	263	1.1%
09 Cluster Bedroom	99	263	1.1%
09 Cluster Bedroom	102	263	1.2%
09 Cluster Bedroom	99	263	1.1%

8.02 Studio Rooms

Location	> 26.00	Max permissible hours	% of annual occupied hours $T_{op} > 26^{\circ}\text{C}$
01 Studio	106	263	1.2%
01 Studio	118	263	1.3%
01 Studio	79	263	0.9%
01 Studio	127	263	1.4%
01 Studio	128	263	1.5%
01 Studio	139	263	1.6%
01 Studio	197	263	2.2%
01 Studio	114	263	1.3%
02 Studio	156	263	1.8%
02 Studio	157	263	1.8%
02 Studio	140	263	1.6%
02 Studio	175	263	2.0%
02 Studio	80	263	0.9%
02 Studio	104	263	1.2%
02 Studio	107	263	1.2%
02 Studio	107	263	1.2%
02 Studio	137	263	1.6%
02 Studio	121	263	1.4%
02 Studio	109	263	1.2%
02 Studio	236	263	2.7%
03 Studio	239	263	2.7%
03 Studio	121	263	1.4%
03 Studio	88	263	1.0%
03 Studio	178	263	2.0%
03 Studio	116	263	1.3%
03 Studio	162	263	1.8%
03 Studio	121	263	1.4%
03 Studio	160	263	1.8%
03 Studio	138	263	1.6%
03 Studio	117	263	1.3%
03 Studio	123	263	1.4%
03 Studio	143	263	1.6%
04 Studio	163	263	1.9%

04 Studio	164	263	1.9%
04 Studio	180	263	2.1%
04 Studio	119	263	1.4%
04 Studio	240	263	2.7%
04 Studio	140	263	1.6%
04 Studio	146	263	1.7%
04 Studio	122	263	1.4%
04 Studio	124	263	1.4%
04 Studio	119	263	1.4%
04 Studio	122	263	1.4%
04 Studio	91	263	1.0%
05 Studio	119	263	1.4%
05 Studio	162	263	1.8%
05 Studio	124	263	1.4%
05 Studio	178	263	2.0%
05 Studio	165	263	1.9%
05 Studio	91	263	1.0%
05 Studio	143	263	1.6%
05 Studio	119	263	1.4%
05 Studio	239	263	2.7%
05 Studio	141	263	1.6%
05 Studio	122	263	1.4%
05 Studio	122	263	1.4%
06 Studio	122	263	1.4%
06 Studio	114	263	1.3%
06 Studio	141	263	1.6%
06 Studio	160	263	1.8%
06 Studio	138	263	1.6%
06 Studio	122	263	1.4%
06 Studio	155	263	1.8%
06 Studio	119	263	1.4%
06 Studio	94	263	1.1%
06 Studio	173	263	2.0%
06 Studio	121	263	1.4%
06 Studio	230	263	2.6%
07 Studio	44	263	0.5%
07 Studio	138	263	1.6%
07 Studio	102	263	1.2%
07 Studio	129	263	1.5%
07 Studio	130	263	1.5%
08 Studio	134	263	1.5%
08 Studio	44	263	0.5%
08 Studio	106	263	1.2%
08 Studio	132	263	1.5%
08 Studio	138	263	1.6%
09 Studio	38	263	0.4%

09 Studio	137	263	1.6%
09 Studio	104	263	1.2%
09 Studio	130	263	1.5%
09 Studio	133	263	1.5%

The ventilation rate within the Studios where the % of annual occupied hours for $T_{op} > 26^{\circ}\text{C}$ is $> 3\%$ will have an enhanced ventilation rate above the 5 ac/h to reduce the percentage to $\leq 3\%$ which is available within the current MVHR unit's capacity.

8.03 Apartment Kitchens

Location	> 26.00	Max permissible hours	% of annual occupied hours $T_{op} > 26^{\circ}\text{C}$
01 Kitchen	76	142	1.6%
02 Kitchen	80	142	1.7%
03 Kitchen	80	142	1.7%
04 Kitchen	81	142	1.7%
05 Kitchen	80	142	1.7%
06 Kitchen	84	142	1.8%
07 10 Bed Kitchen	91	142	1.9%
07 Kitchen	178	142	3.8%
08 10 Bed Cluster Kitchen	91	142	1.9%
08 Kitchen	176	142	3.7%
09 10 Bed Cluster Kitchen	88	142	1.9%
09 Kitchen	165	142	3.5%

The ventilation rate within the Apartment Kitchens where the % of annual occupied hours for $T_{op} > 26^{\circ}\text{C}$ is $> 3\%$ will have an enhanced ventilation rate above the 5 ac/h to reduce the percentage to $\leq 3\%$ which is available within the current MVHR unit's capacity.