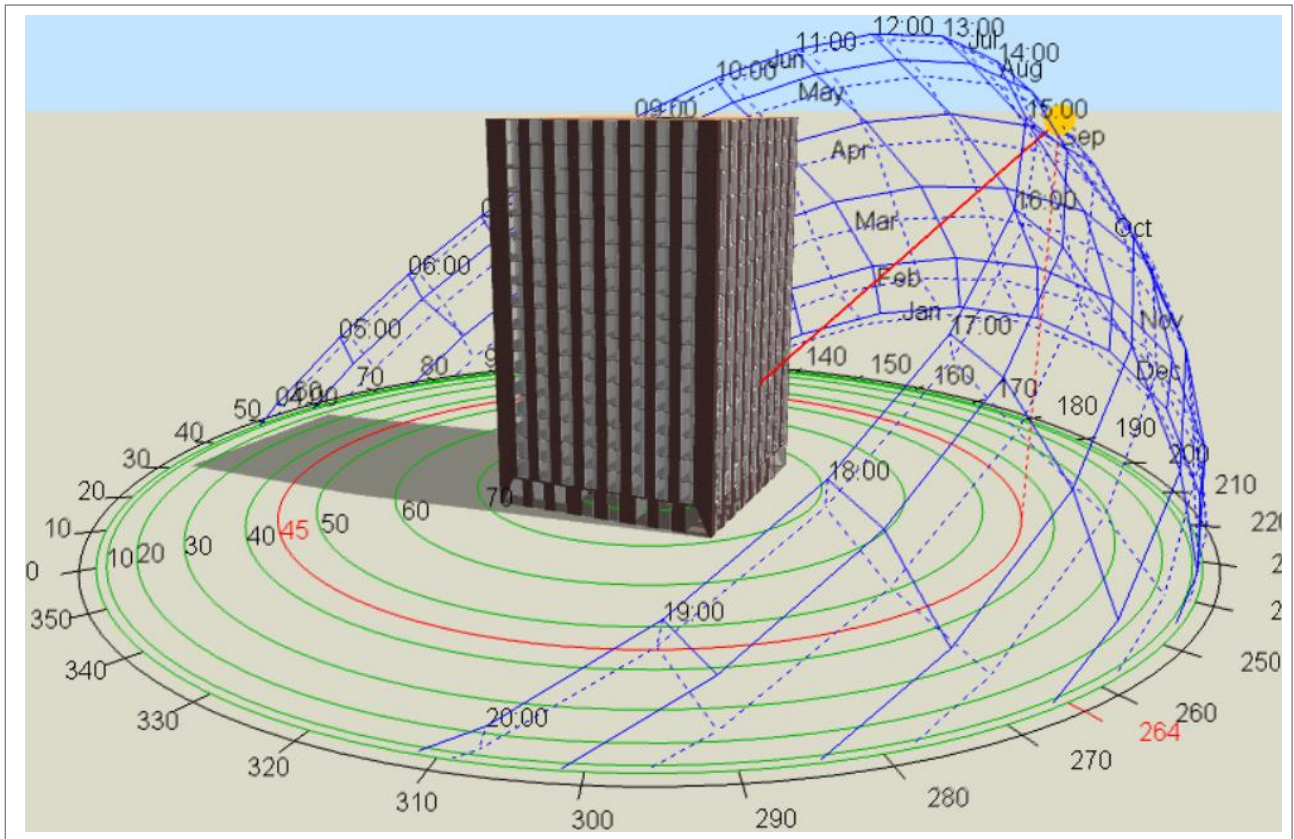




Overheating Assessment

85 Rochdale Road
Manchester

23rd March 2026

North:

t: 0151 933 0328
m: info@baseenergy.co.uk

202 Stanley Road
Bootle
Liverpool
L20 3EP

South:

t: 020 3266 2016
m: info@baseenergy.co.uk

117 Knyvett House,
Watermans Business
Park, the Causeway,
Staines-upon-Thames
TW18 3BA

Document Status

Client: McGoff Group

Site: 85 Rochdale Road, Manchester

Proposals: Erection of a 17 storey residential apartment building (Use Class C3 (a)), with associated access, amenity, landscaping, public realm, infrastructure and other associated works. Demolition of existing vacant building on site, comprising of ground floor retail and a first floor apartment.

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Appendix A: Dynamic Thermal Modelling (TM59, TM52) Results

Document Control Record:

Prepared by	Checked by	Date	Job	Revision
MH	PK	22.10.2025	13436	Rev0
MH	PK	10.11.2025	13436	Rev1
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1 Scope

This report has been prepared to assess the likelihood of overheating for the proposed development at 85 Rochdale Road in Manchester which consists of the erection of a 17 storey residential apartment building (Use Class C3 (a)), with associated access, amenity, landscaping, public realm, infrastructure and other associated works. Demolition of existing vacant building on site, comprising of ground floor retail and a first floor apartment.

This overheating report focuses on the new build residential apartments and communal amenity spaces.

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

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

Moreover, this overheating assessment demonstrates that the proposed development complies with the relevant current guidance in CIBSE TM52/59, ISO 7730:2005 and the requirements of the Approved Document Part O following the dynamic thermal modelling method.

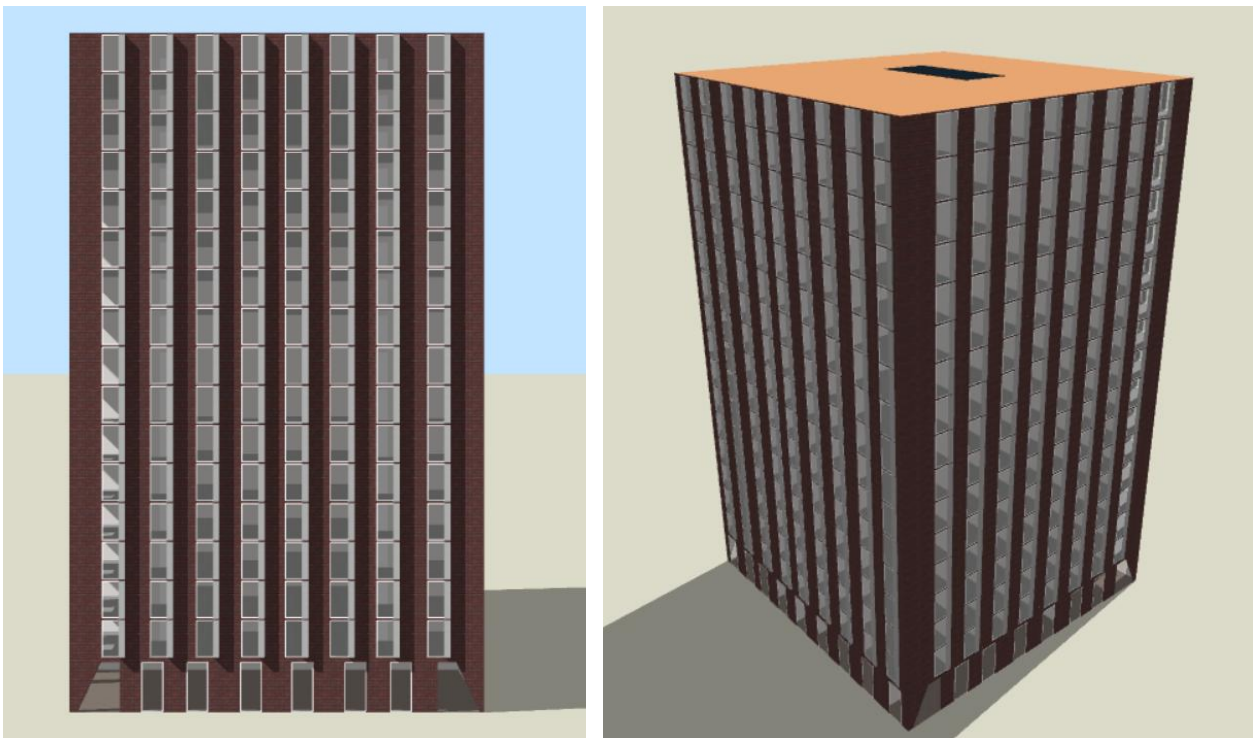


Figure 01 - DesignBuilder 3D Rendering

2 Executive Summary

An overheating assessment has been carried to demonstrate the potential conditions and risk of overheating for the proposed development.

The overheating mitigation strategy includes the use of hybrid MVHR ventilation and south-west facing glazing with a g-value of 0.35 to minimise solar gains. The communal amenity spaces shall be provided with a VRF system capable of providing cooling in peak summer conditions to ensure compliance.

The residential MVHR units have been modelled with capability of boosted rates up to 80l/s and a cooling module (approximately 1.24kW cooling) to provide targeted peak lopping when the system is in boost mode.

The proposed overheating mitigation measures are summarised in the table below:

Overheating Strategy	TM59 / Part O Compliance	Notes
- External shading via window reveals and perforated metal panels - Glazing with a g-value of 0.45 (NE) and 0.35 (SE through NW) - Hybrid MVHR Ventilation - VRF to communal amenity space		Overheating strategy compliant

3 Part O: Dynamic Thermal Modelling Method

To demonstrate compliance with the requirement O1 of the Approved document Part O for residential dwellings, this report has used the Dynamic thermal modelling method approved by the aforementioned document.

To demonstrate compliance using the dynamic thermal modelling method, all of the following have been followed:

- a) CIBSE TM59 methodology for predicting overheating risk
- b) The limits on the use of CIBSE TM59 methodology set out below
- c) The acceptable strategies for reducing overheating risk

Limits on CIBSE's TM59 modelling

All of the following limits on CIBSE's TM59, section 3.3 apply.

- a) When a room is occupied during the day (8am to 11pm), openings should be modelled to do all of the following:
 - i. Start to open when the internal temperature exceeds 22°C
 - ii. Be fully open when the internal temperature exceeds 26°C
 - iii. Start to close when internal temperature falls below 26°C
 - iv. Be fully closed when the internal temperature falls below 22°C
- b) At night (11pm to 8am), openings should be modelled as fully open if both of the following apply:
 - i. The opening is on the first floor or above and not easily accessible
 - ii. The internal temperature exceeds 23°C at 11pm.
- c) When a ground floor of easily accessible room is unoccupied, both of the following apply:

Ensuring the Overheating Strategy is Usable

Approved Document O lists a number of measures to ensure the overheating mitigation strategy can be feasibly implemented in reality, as well as complying with overlapping building codes. The full literature can be found in *Section 3: Ensuring the overheating mitigation strategy is usable* of Approved Document O. A summary of these standards has been compiled below:

1.1 Noise

- **3.2)** 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).

- **3.3)** 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).

1.2 Pollution

- **3.5)** 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.

1.3 Security

- **3.6)** 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.

- Ground floor bedrooms
- Easily accessible bedrooms

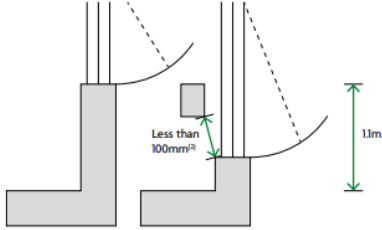
1.4 Protection from Falling

- **3.8)** 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.

- **3.9)** Openings that can be opened wider than 100mm may form part of the overheating mitigation strategy where they meet all of the following conditions:

- 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.
- Guarding meets the minimum standards in Table 3.1
- Guarding does not allow children to easily climb it. For example, horizontal bars should generally be avoided.

Change in floor level between inside and outside	Guarding height ⁽¹⁾
Less than 600mm	See Approved Document K
More than 600mm	1.1m



NOTES:

- This approved document has increased levels of protection from falling compared to Approved Document K. Where applicable, the higher standard applies.
- Guarding should be sized to prevent the passage of a 100mm sphere.

For more information, please refer to *Approved Document K*.

Window Restrictions

The acoustic planning report carried out by dbx acoustics states that the that the required internal ambient noise levels can only be achieved with closed windows with the windows only openable for purge ventilation. Therefore, the windows have been modelled as permanently closed for this overheating assessment.

4 Overheating Assessment Criteria

CIBSE TM59: Design methodology for the assessment of overheating risk in homes (2017)

For the residential elements of the proposed development, this report includes only occupied spaces such as Kitchens/Living Room and Bedrooms. The analysis has been based on CIBSE Technical Memorandum 59 (TM59) 'Design methodology for the assessment of overheating risk in homes', that states:

As there are limited opportunities for natural ventilation, due to fixed glazing and noise restrictions, the criteria for homes predominantly mechanically ventilated has been used for this analysis:

- **For homes with restricted windows 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 (CIBSE Guide A).**

In accordance with TM59 guidance, a sample of dwellings have been selected for analysis:

- All first-floor units (representative of all mid-floors)
- All top-floor units

CIBSE TM52 and ISO 7730:2005 Table A Annex A

TM52 applies to naturally ventilated or mixed-mode buildings. As it is proposed to provide the communal amenity spaces with VRF (mechanical cooling), the 'Category B' PMV and PPD values in the table below have been targeted as part of this assessment.

Category	Description	Allowance predicted mean vote (PMV)	Allowable predicted percentage dissatisfied (PPD)
A	Recommended for spaces occupied by very sensitive and fragile persons with special requirements (very young children, elderly, ill)	$-0.2 < \text{PMV} < 0.2$	<6%
B	Suitable for most new buildings and renovations	$-0.5 < \text{PMV} < 0.5$	<10%
C	Suitable for existing buildings	$-0.7 < \text{PMV} < 0.7$	<15%

5 The Model

The building has been modelled using DesignBuilder Energyplus software. The software complies with CIBSE Application Manual AM11: 1998 Building Energy and Environmental Modelling and provides a full dynamic simulation of thermal conditions in the building.

Geometry

A three-dimensional analysis model has been generated for the proposed development. The model was developed using drawn information supplied by Jon Matthews Architects.

As with any modelling exercise, some approximations have been made, but care has been taken to ensure the scale and internal dimensions of the model are as close as practicable to the design drawings, and that glazing areas are as accurately represented as the provided information allows.

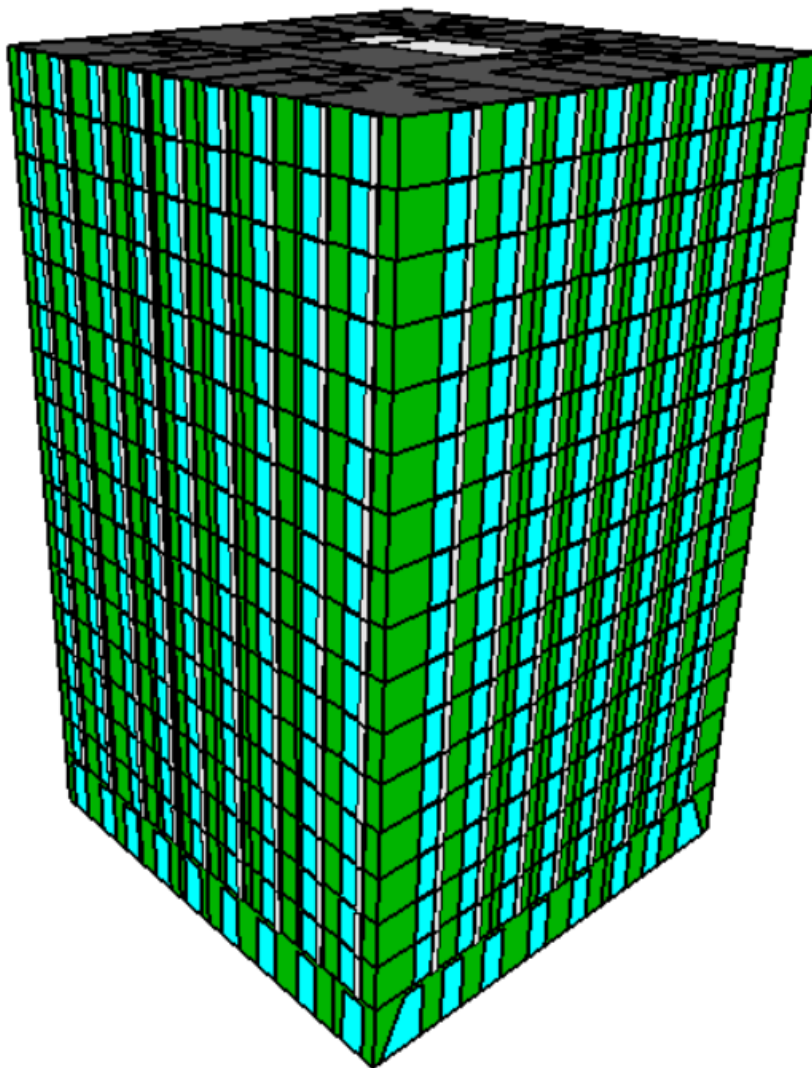


Figure 03 - Thermal Model image

Site Location and Climate Data

The CIBSE DSY weather file for Manchester (DSY1_2020_High50) has been selected as this is the closest weather file for the site.

The weather file contains hourly data for air temperatures (wet bulb and dry bulb), wind speed and direction, atmospheric pressure, solar irradiation and cloud cover.

DSY (Design Summer Year) is the industry standard weather file for use in overheating assessments. It should be noted that the current DSY was used, and future weather files based on various predicted climate change scenarios are available. Usage of these future weather files would result in higher predicted internal temperatures than reported here as the climate is predicted to encounter more prolonged warm spells and higher peak temperatures as time progresses.



Figure 04 - Site Location

The site is located on Rochdale Road in Manchester.

In addition to the compliance assessment using DSY1, the overheating analysis has also been carried out using DSY2 and DSY3 weather files to provide an indication of the building's performance under more extreme and prolonged warm weather conditions. The results for each weather file is shown within the appendix of this report.

Building Construction and U-Values

Drawings have been provided by the architect which were used to create the thermal model.

Table 1 shows the construction U-values and air infiltration used in the thermal model. These values have been informed by the energy statement report produced for the development.

Table 01: *U Values applied to the Dynamic Simulation Model*

Element	Modelled U Value (W/m²K)
External Wall	0.17
Flat Roof	0.11
Exposed Floor	0.12
Glazing	1.30
Doors	1.20
Air Leakage (m ³ (h.m ²) @ 50Pa	3.0
Glazing g Value (NE)	45%
Glazing g Value (SE, SE & NW)	35%

Internal Gains

For the residential units, the internal heat gains and operating profiles that are applied to each occupied space have been taken from the prescriptive templates outlined in CIBSE TM59 (Design methodology for the assessment of overheating risk in homes).

For the communal amenity spaces, lighting and equipment gains have been assumed at 10 W/m².

Mechanical Ventilation

Mechanical ventilation in the form of MVHR is proposed to provide fresh air to the apartments.

This is a low energy, continuous mechanical ventilation system designed to replace conventional extract ventilation systems (such as intermittent systems) by drawing moisture laden air out of the kitchen and wet rooms while supplying fresh air to habitable rooms such as Bedrooms and Living spaces.

An additional benefit is an air pathway is also formed drawing warm out of habitable spaces and evacuated from the dwelling, with the makeup air being provided by mechanically supplied air from the unit in addition to any windows in habitable spaces (when opened).

The minimum whole house ventilation rates can be seen in table 1.3 – these have been taken from *Approved Document F*.

For more information, please refer to Approved Document F, Volume 1: Dwellings.

The MVHR should be designed to ensure that the minimum rates in Part F are met.

It is assumed that the MVHR units will run continuously at a trickle rate to meet minimum Part F requirements. When required in peak summer conditions, the units will be capable of boosting up to 80 l/s per apartment with a summer bypass feature to avoid any heat recovery and make use of lower external temperatures.

Table 1.3 Minimum whole dwelling ventilation rates by no. of bedrooms

Number of bedrooms ⁽¹⁾⁽²⁾	Minimum ventilation rate by no. of bedrooms (l/s)
1	19
2	25
3	31
4	37
5	43

NOTES:

1. If the dwelling only has one habitable room, a minimum ventilation rate of 13l/s should be used.
2. For each additional bedroom add 6l/s to the values in Table 1.3

▲ *Total Combined rate of continuous ventilation in the dwelling needs to meet the above minimum rates.*

Mechanical cooling

Integrated cooling modules have been modelled as part of the residential MVHR units. A cooling capacity of approximately 1.24kW has been assumed for each unit and is intended to provide targeted peak-opping when the system is in boosted mode. Allowing the occupants to activate the cooling mode when internal temperatures rise toward overheating thresholds.

The cooling capacity of the hybrid MVHR unit has been distributed between the habitable rooms within the thermal model to reflect the higher internal and solar gains typically associated with the kitchen/living spaces. The exact distribution of cooling airflow and capacity should be determined at detailed design stage; however it is expected that the primary living spaces will require a greater proportion of the available cooling capacity than the bedrooms.

The communal amenity spaces are assumed to be provided with a Variable Refrigerant Flow (VRF) system capable of heating and cooling. A cooling set-point of 23C has been assumed for the purposes of this overheating assessment.

6 Results

A full set of TM59 & TM52 results can be seen in Appendix A of this report.

The proposed overheating mitigation strategy is shown below:

Overheating Strategy	TM59 / Part O Compliance	Notes
- External shading via window reveals and perforated metal panels - Glazing with a g-value of 0.45 (NE) and 0.35 (SE through NW) - Hybrid MVHR Ventilation - VRF to communal amenity space	☒	Overheating strategy compliant

7 Summary

The assessment has shown that the proposed development at 85 Rochdale Road in Manchester presents a low risk of overheating providing the overheating strategy listed within this report is implemented.

The residential overheating mitigation strategy includes:

- External shading features such as external window reveals and perforated metal panels to openable windows
- Hybrid MVHR ventilation capable of boosted rates up to 80l/s. A cooling module is integrated to provide targeted peak lopping when the system is in boosted mode.
- SE, SW and NW facing glazing with a g-value of 0.35 to minimise solar gains.

The residential overheating analysis has also been carried out using alternative weather files DSY2 and DSY3. The results demonstrate that all flats remain compliant under DSY2, while under the more onerous DSY3 scenario several rooms are identified as exceeding overheating criteria, reflecting sensitivity to prolonged summer conditions.

The communal amenity spaces shall be provided with a VRF system capable of providing cooling in peak summer conditions. The thermal modelling results show that the PMV and PPD figures are within range of table A.1 Annex A ISO 7730:2005.

Though the regulations do not permit the use of blinds and curtains in the calculations, if the sun shines directly into a living space, the occupant should consider closing the curtains or blinds to limit solar gains and try and keep rooms as cool as possible.

Appendix A: Detailed results

DSY1

Unit	Room	% Hrs Exceeded	Pass/Fail
1.01	Kitchen Living	0.26	Pass
1.01	Bedroom 1	0.49	Pass
1.01	Bedroom 2	2.11	Pass
1.02	Kitchen Living	0.00	Pass
1.02	Bedroom 1	2.24	Pass
1.02	Bedroom 2	2.56	Pass
1.02	Bedroom 3	2.81	Pass
1.03	Kitchen Living	0.65	Pass
1.03	Bedroom 1	0.38	Pass
1.03	Bedroom 2	1.43	Pass
1.04	Kitchen Living	0.11	Pass
1.04	Bedroom 1	0.90	Pass
1.04	Bedroom 2	0.47	Pass
1.05	Kitchen Living	0.90	Pass
1.05	Bedroom 1	0.91	Pass
1.05	Bedroom 2	1.50	Pass
1.06	Kitchen Living	0.00	Pass
1.06	Bedroom 1	0.00	Pass
1.07	Kitchen Living	0.00	Pass
1.07	Bedroom 1	0.00	Pass
1.08	Kitchen Living	2.05	Pass
1.08	Bedroom 1	1.14	Pass
1.08	Bedroom 2	2.64	Pass
1.09	Kitchen Living	0.64	Pass
1.09	Bedroom 1	2.00	Pass
1.09	Bedroom 2	2.15	Pass
16.01	Kitchen Living	2.19	Pass
16.01	Bedroom 1	1.24	Pass
16.01	Bedroom 2	2.45	Pass
16.02	Kitchen Living	1.02	Pass
16.02	Bedroom 1	2.19	Pass
16.03	Kitchen Living	1.02	Pass
16.03	Bedroom 1	2.19	Pass
16.04	Kitchen Living	0.48	Pass
16.04	Bedroom 1	1.01	Pass
16.04	Bedroom 2	0.69	Pass
16.05	Kitchen Living	1.28	Pass
16.05	Bedroom 1	1.00	Pass
16.05	Bedroom 2	1.48	Pass
16.06	Kitchen Living	1.28	Pass
16.06	Bedroom 1	1.00	Pass
16.06	Bedroom 2	1.48	Pass
16.07	Kitchen Living	0.17	Pass
16.07	Bedroom 1	0.00	Pass
16.08	Kitchen Living	0.17	Pass
16.08	Bedroom 1	0.00	Pass
16.09	Kitchen Living	2.71	Pass
16.09	Bedroom 1	1.46	Pass
16.09	Bedroom 2	2.33	Pass
16.10	Kitchen Living	1.24	Pass
16.10	Bedroom 1	1.62	Pass
16.10	Bedroom 2	2.10	Pass

DSY2

Unit	Room	% Hrs Exceeded	Pass/Fail
1.01	Kitchen Living	0.12	Pass
1.01	Bedroom 1	0.11	Pass
1.01	Bedroom 2	0.79	Pass
1.02	Kitchen Living	0.00	Pass
1.02	Bedroom 1	0.39	Pass
1.02	Bedroom 2	0.72	Pass
1.02	Bedroom 3	0.46	Pass
1.03	Kitchen Living	0.50	Pass
1.03	Bedroom 1	0.10	Pass
1.03	Bedroom 2	0.90	Pass
1.04	Kitchen Living	0.11	Pass
1.04	Bedroom 1	0.61	Pass
1.04	Bedroom 2	0.29	Pass
1.05	Kitchen Living	0.65	Pass
1.05	Bedroom 1	0.50	Pass
1.05	Bedroom 2	0.31	Pass
1.06	Kitchen Living	0.00	Pass
1.06	Bedroom 1	0.00	Pass
1.07	Kitchen Living	0.00	Pass
1.07	Bedroom 1	0.00	Pass
1.08	Kitchen Living	1.05	Pass
1.08	Bedroom 1	0.24	Pass
1.08	Bedroom 2	0.89	Pass
1.09	Kitchen Living	0.18	Pass
1.09	Bedroom 1	0.51	Pass
1.09	Bedroom 2	0.75	Pass
16.01	Kitchen Living	1.49	Pass
16.01	Bedroom 1	0.45	Pass
16.01	Bedroom 2	1.36	Pass
16.02	Kitchen Living	0.73	Pass
16.02	Bedroom 1	0.84	Pass
16.03	Kitchen Living	0.73	Pass
16.03	Bedroom 1	0.84	Pass
16.04	Kitchen Living	0.63	Pass
16.04	Bedroom 1	0.33	Pass
16.04	Bedroom 2	0.83	Pass
16.05	Kitchen Living	0.19	Pass
16.05	Bedroom 1	0.68	Pass
16.05	Bedroom 2	0.39	Pass
16.06	Kitchen Living	0.73	Pass
16.06	Bedroom 1	0.61	Pass
16.06	Bedroom 2	0.58	Pass
16.07	Kitchen Living	0.05	Pass
16.07	Bedroom 1	0.00	Pass
16.08	Kitchen Living	0.17	Pass
16.08	Bedroom 1	0.00	Pass
16.09	Kitchen Living	1.59	Pass
16.09	Bedroom 1	0.45	Pass
16.09	Bedroom 2	1.20	Pass
16.10	Kitchen Living	0.61	Pass
16.10	Bedroom 1	0.85	Pass
16.10	Bedroom 2	1.17	Pass

DSY3

Unit	Room	% Hrs Exceeded	Pass/Fail
1.01	Kitchen Living	0.59	Pass
1.01	Bedroom 1	0.52	Pass
1.01	Bedroom 2	2.64	Pass
1.02	Kitchen Living	0.00	Pass
1.02	Bedroom 1	2.37	Pass
1.02	Bedroom 2	3.79	Fail
1.02	Bedroom 3	3.05	Fail
1.03	Kitchen Living	1.90	Pass
1.03	Bedroom 1	0.50	Pass
1.03	Bedroom 2	2.79	Pass
1.04	Kitchen Living	0.33	Pass
1.04	Bedroom 1	2.18	Pass
1.04	Bedroom 2	1.31	Pass
1.05	Kitchen Living	2.79	Pass
1.05	Bedroom 1	2.31	Pass
1.05	Bedroom 2	2.09	Pass
1.06	Kitchen Living	0.00	Pass
1.06	Bedroom 1	0.00	Pass
1.07	Kitchen Living	0.00	Pass
1.07	Bedroom 1	0.00	Pass
1.08	Kitchen Living	3.79	Fail
1.08	Bedroom 1	1.54	Pass
1.08	Bedroom 2	3.24	Fail
1.09	Kitchen Living	0.93	Pass
1.09	Bedroom 1	2.15	Pass
1.09	Bedroom 2	2.58	Pass
16.01	Kitchen Living	4.53	Fail
16.01	Bedroom 1	1.91	Pass
16.01	Bedroom 2	3.88	Fail
16.02	Kitchen Living	1.85	Pass
16.02	Bedroom 1	3.45	Fail
16.03	Kitchen Living	1.85	Pass
16.03	Bedroom 1	3.45	Fail
16.04	Kitchen Living	2.72	Pass
16.04	Bedroom 1	2.33	Pass
16.04	Bedroom 2	1.47	Pass
16.05	Kitchen Living	0.90	Pass
16.05	Bedroom 1	2.33	Pass
16.05	Bedroom 2	1.47	Pass
16.06	Kitchen Living	3.22	Fail
16.06	Bedroom 1	2.26	Pass
16.06	Bedroom 2	2.52	Pass
16.07	Kitchen Living	0.14	Pass
16.07	Bedroom 1	0.00	Pass
16.08	Kitchen Living	0.14	Pass
16.08	Bedroom 1	0.00	Pass
16.09	Kitchen Living	5.10	Fail
16.09	Bedroom 1	2.21	Pass
16.09	Bedroom 2	3.66	Fail
16.10	Kitchen Living	2.47	Pass
16.10	Bedroom 1	2.89	Pass
16.10	Bedroom 2	3.45	Fail

PMV and PVD results in air-conditioned areas

Room	PMV	PPD (%)
Building Manager	0.13	7.98
Communal Amenity	0.23	9.95